## Academic and Registration Calendar

### 2015–16

<table>
<thead>
<tr>
<th>SUMMER 2015</th>
<th>START</th>
<th>END</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration</td>
<td>March 23</td>
<td>May 3</td>
</tr>
<tr>
<td>Late Registration for 14- and 13-week semesters</td>
<td>May 4</td>
<td>May 15</td>
</tr>
<tr>
<td>Late Registration for 12-week semester</td>
<td>May 25</td>
<td>June 5</td>
</tr>
<tr>
<td>Add/drop period for 14- and 13-week semesters</td>
<td>May 11</td>
<td>May 17</td>
</tr>
<tr>
<td>Add/drop period for 12-week semester</td>
<td>June 1</td>
<td>June 7</td>
</tr>
<tr>
<td>14-week semester (Applied Economics, GIS, ESP, EPC)</td>
<td>May 11</td>
<td>August 22</td>
</tr>
<tr>
<td>13-week semester (Communication and Museum Studies)</td>
<td>May 11</td>
<td>August 15</td>
</tr>
<tr>
<td>12-week semester (All other AAP Programs)</td>
<td>June 1</td>
<td>August 22</td>
</tr>
<tr>
<td>Withdraw/audit deadline for 14- and 13-week semester</td>
<td>July 24</td>
<td></td>
</tr>
<tr>
<td>Withdraw/audit deadline for 12-week semester</td>
<td>August 3</td>
<td></td>
</tr>
<tr>
<td>May Intensive</td>
<td>May 7</td>
<td>May 26</td>
</tr>
<tr>
<td>Holidays - NOTE: No class May 23 or July 4.</td>
<td>May 25 (Memorial Day)</td>
<td>July 4 (Independence Day)</td>
</tr>
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<thead>
<tr>
<th>FALL 2015</th>
<th>START</th>
<th>END</th>
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<tbody>
<tr>
<td>Registration</td>
<td>June 22</td>
<td>August 22</td>
</tr>
<tr>
<td>Late Registration</td>
<td>August 25</td>
<td>September 1</td>
</tr>
<tr>
<td>Add/drop period for 14- and 13-week semester</td>
<td>September 2</td>
<td>September 13</td>
</tr>
<tr>
<td>14-week semester (All other AAP Programs)</td>
<td>September 2</td>
<td>December 14</td>
</tr>
<tr>
<td>13-week semester (Communication and Museum Studies)</td>
<td>September 2</td>
<td>December 7</td>
</tr>
<tr>
<td>Withdraw/audit deadline for 14- and 13-week semester</td>
<td>November 13</td>
<td></td>
</tr>
<tr>
<td>Holidays - NOTE: No class Sep. 7 or Nov. 25-26.</td>
<td>November 25</td>
<td>November 29</td>
</tr>
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<tr>
<th>SPRING 2016</th>
<th>START</th>
<th>END</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration</td>
<td>November 2</td>
<td>January 17</td>
</tr>
<tr>
<td>Late Registration</td>
<td>January 18</td>
<td>January 29</td>
</tr>
<tr>
<td>January Intersession</td>
<td>January 4</td>
<td>January 23</td>
</tr>
<tr>
<td>Add/drop period for 14- and 13-week semester</td>
<td>January 25</td>
<td>January 31</td>
</tr>
<tr>
<td>14-week semester (All other AAP Programs)</td>
<td>January 25</td>
<td>May 7</td>
</tr>
<tr>
<td>13-week semester (Communication and Museum Studies)</td>
<td>January 25</td>
<td>April 30</td>
</tr>
<tr>
<td>Withdraw/audit deadline for 14- and 13-week semester</td>
<td>April 4</td>
<td></td>
</tr>
<tr>
<td>Holidays</td>
<td>January 1 (New Year's Day)</td>
<td>January 18 (MLK Day)</td>
</tr>
<tr>
<td>Spring Break</td>
<td>March 14</td>
<td>March 19</td>
</tr>
<tr>
<td>KSAS Graduation Ceremony</td>
<td></td>
<td>TBD</td>
</tr>
</tbody>
</table>
The university reserves the right to change without prior notice any programs, tuition and fees, requirements, or regulations published in this catalog. This catalog is not to be regarded as a contract. Multiple means of communication may be used by the university for announcing changes of this nature including, but not exclusive to, email and/or paper notice. Students are provided an email account from Johns Hopkins University (JHU). The JHU email account will be used by the university for general and official notice/business. To establish an email account visit my.jh.edu.

Published once a year by Johns Hopkins University, Krieger School of Arts and Sciences, Advanced Academic Programs. March 2015.
We at the Johns Hopkins University Advanced Academic Programs want to help you get to where you want to be. We know that as an adult with a busy life you look for the flexibility and depth our part-time graduate programs offer for your personal and professional development. We hope you will find in this catalog courses that inspire you to achieve your goals.

Advanced Academic Programs offers a variety of graduate degrees and certificates in fields ranging from Biotechnology to Museum Studies. In all AAP programs, a strong academic foundation supports the applied knowledge and skills students acquire. Classes are offered in several locations and online. AAP also offers joint degrees with other schools at Johns Hopkins University. Our teachers include research faculty from across the university and practitioners at the highest levels of their professions from government, industry, and the non-profit sector. Our students choose Johns Hopkins because they know that where you study matters. They desire an academically rigorous education that challenges them intellectually and offers them opportunities to meet others who have similar goals to advance in their careers or enrich their personal lives. Together, Advanced Academic Programs faculty and students create a learning experience that is unparalleled in part-time graduate education.

Meeting the same criteria for excellence that characterize all Johns Hopkins University programs, AAP courses are judged among the best in the country, if not the world. We recognize that as an adult student you bring a wealth of life experience and practical insights to your classroom learning. Our faculty is committed to their teaching and to their own learning in professions that are rapidly changing. AAP demands that its faculty design and deliver courses that integrate your real-world perspectives with the knowledge they bring as researchers, scholars, and practitioners. The combination produces innovative ideas and engaged learning. In an AAP class, you will find your assumptions challenged, your old ways of thinking changed, and your mind opened to new concepts and conversations.

Learning happens in the classroom, whether it is on site or online, and also in countries around the globe. Many of AAP’s programs include workshops and short-term classes led by Johns Hopkins faculty in Europe, Asia, and other international locations. International students enroll in virtually all AAP programs, adding global perspectives to your discussions and enriching your network of colleagues and friends.

While you are studying for your degree and after you graduate, AAP offers career advising on site and online; networking with alumni from throughout the university and the world; and many opportunities to become part of a vibrant community of faculty and students.

We invite you to explore this catalog. Visit our website: advanced.jhu.edu and contact us for more information. We are eager to help you advance in your career, prepare for a new profession, and grow personally. We look forward to telling you more about the Advanced Academic Programs at Johns Hopkins University.

Sincerely,

Kathleen Burke, Ph.D.
Associate Dean
The Krieger School of Arts and Sciences is at the heart of a leading, diverse, global coeducational university. Privately endowed, The Johns Hopkins University was founded in 1876 as the first true American university on the European model: a graduate institution with an associated preparatory college, a place where knowledge would be created and assembled, as well as taught.

Today, the Krieger School of Arts and Sciences is the core institution of the Johns Hopkins complex of schools, centers, and institutes. Its home is the park-like Homewood campus in the residential Charles Village section of northern Baltimore City.

Advanced Academic Programs
The School of Arts and Sciences recognizes the intellectual strength and educational requirements of working adults. Through the Advanced Academic Programs, it offers a Johns Hopkins education to those wishing to attend graduate school. Courses leading to master’s degrees are held in the evening and on weekends at the Homewood campus in Baltimore, the Montgomery County Campus in Rockville, the Washington, DC Center, near Dupont Circle, and online.

Drawing upon over a century of research and teaching expertise, the programs offer advanced instruction in scientific fields of current interest and innovative graduate study in the humanities and social sciences. While based on the latest scientific and scholarly knowledge, course work emphasizes the application of such knowledge to practical problems. Classes are designed to provide individual attention and to encourage student contribution.

Degree Granting Divisions of The Johns Hopkins University
- Bloomberg School of Public Health
- Carey Business School
- Krieger School of Arts and Sciences
- Nitze School of Advanced International Studies
- Peabody Institute
- School of Education
- School of Medicine
- School of Nursing
- Whiting School of Engineering

The Johns Hopkins University is privately endowed and accredited by the Middle States Commission on Higher Education, 3624 Market Street, Philadelphia, PA 19104-2680; 267.284.5000. Since the university’s first president, Daniel Coit Gilman, assembled the first faculty in 1876, education in the arts and sciences at Johns Hopkins has been carried out in a research environment, with international distinction, under the supervision of active researchers. The belief in the inseparability of education and research still guides the academic programs of today’s School of Arts and Sciences. Distinguished scholars and scientists share and exchange ideas and knowledge with undergraduates and graduates, encouraging creative thinking and independent research. Residential students take courses from Anthropology to Writing Seminars, offered by 24 degree-granting departments that confer the Bachelor of Arts, the Bachelor of Science, the Master of Arts, the Master of Fine Arts, the Master of Science, and the Doctor of Philosophy. Information regarding full-time education can be found in the Arts and Sciences/Engineering Undergraduate and Graduate Programs catalog. Admission information for the Office of Undergraduate Admissions, Mason Hall, Homewood Campus, or 410.516.8171. Graduate Admissions for full-time students in the Krieger School of Arts and Sciences and the Whiting School of Engineering can be found at 101 Whitehead Hall, Homewood Campus, or 410.516.8174.
Contact Information

THE WASHINGTON, DC CENTER
1717 Massachusetts Avenue, NW, Suite 104
Washington, DC 20036

Advanced Academic Programs
Admissions and Registration, Suite 101
Main Number 202.452.1940
800.847.3330
Fax Number 202.452.1970
Email aapadmissions@jhu.edu
aapregistration@jhu.edu

Administrative Office, Suite 104
Main Number 202.452.1280
Fax Number 202.452.8713
Student & Faculty Support Services 202.452.0749
Career Services 202.452.0983
Disability Services 202.452.1952

Washington Library Resource Center, Suite 100
Main Number 202.452.0714
Fax Number 202.530.9857
Email washrocklibraries@jhu.edu

Transcripts
75 Garland Hall 410.516.8080
Office of International Services
358 Garland Hall 410.516.1013

MONTGOMERY COUNTY CAMPUS
9601 Medical Center Drive
Rockville, Maryland 20850

Administrative Offices, Gilchrist Hall
Main Number 301.294.7000
Fax Number 301.315.7103
Student & Faculty Support Services 301.294.7162
Montgomery County Library Resource Center 301.294.7030

GENERAL INFORMATION
Course Schedules advanced.jhu.edu
Weather/Cancellation Information 410.516.7781
800.548.9004
Textbooks 800.325.3252
mbsdirect.net

HOMEWOOD CAMPUS
Wyman Park Building
Suite S740
3400 N. Charles Street
Baltimore, Maryland 21218

Administrative Offices
Main Number 410.516.6749
Fax Number 410.516.6017
Student & Faculty Support Services 410.516.4578
Financial Aid 146 Garland Hall 410.516.8028
Sheridan Libraries Milton S. Eisenhower Library
Circulation 410.516.8370
University Registrar
75 Garland Hall 410.516.8080
Student Accounts
B31 Garland Hall 410.516.8158
Krieger School of Arts and Sciences
Administration and Faculty

ADMINISTRATION

Beverly Wendland .................................................. James Barclay Knapp Dean
Kathleen M. Burke ........................................... Associate Dean, Advanced Academic Programs
Brandon Boulter .............................................. Assist. Dean, Admissions, Marketing & Enrollment
Kai Sauer ......................................................... Assist. Dean, Finance and Business Operations
Briggs Rolfsrud ................................................ Director, Student and Faculty Services
Pamela Wimbush ............................................... Director, Instructional Resource Center

FACULTY

Applied Economics
Laurence Ball ..................................................... Program Chair
Frank D. Weiss ................................................... Program Director
Ahmed Mahmud ................................................. Program Coordinator

Biotechnology Studies
Bertrand Garcia-Moreno ........................................ Program Chair
Kristina Obom .................................................. Program Director, Biotechnology and Bioinformatics; and Director of the Center for Biotechnology Education
Patrick J. Cummings .......................................... Program Director, Biotechnology
Lynn Johnson Langer ......................................... Program Director, Biotechnology Enterprise and Regulatory Science
Alexandra Tan .................................................... Program Director, Health Science Intensive
Roza Selimyan .................................................... Coordinator, Health Science Intensive
Thomas Colonna ................................................ Associate Director, Regulatory Science
Robert Lessick .................................................... Associate Director and Senior Lecturer, Biotechnology Education
Meredith Safford ................................................ Lecturer and Coordinator, Biotechnology
Jamie Austin ..................................................... Lecturer and Coordinator, Regulatory Science
Katherine Wellman ............................................. Lecturer and Coordinator, Biotechnology Enterprise
Beatrice Kondo .................................................. Lecturer and Coordinator, Bioinformatics

Communication
Brad Leithauser .................................................. Interim Program Chair
Memi Miscally .................................................. Program Director
Susan Allen ........................................................ Assistant Director
Elizabeth Patton ................................................ Program Coordinator

Environmental Programs
Bertrand Garcia-Moreno ........................................ Program Chair
Antoinette WinklerPrins .................................. Director, Environmental Programs

Daniel Zachary .................................................. Associate Program Director, Energy Policy and Climate
Geri Miller ......................................................... Program Coordinator, Geographic Information Systems

Governmental Studies
Benjamin Ginsberg ............................................. Program Chair
Kathy Wagner Hill ............................................ Director of the Center for Advanced Governmental Studies
Dorothea Wolfson .............................................. Program Director, Government
Mark Stout ...................................................... Program Director, Global Security Studies & Intelligence
Paul Weinstein Jr. .............................................. Program Director, Public Management
Jennifer Bachner .............................................. Program Director, Government Analytics
Char Mollison ................................................... Program Coordinator, Nonprofit Management
Sarah O’Byrne .................................................. Program Coordinator, GSS and Public Management

Master of Liberal Arts
P. Kyle McCarter .............................................. Program Chair
D. Melissa Hilbish ............................................. Program Director and Director of the Center for Liberal Arts

Museum Studies
Rebecca M. Brown ............................................. Program Chair
Phyllis Hecht ................................................... Program Director
Sarah Chicone .................................................. Assistant Director
Karen Wizevich ............................................... Program Coordinator
Judith Landau ................................................... Internship Coordinator
Joyce Ray .......................................................... Program Coordinator, Digital Curation

National Security Studies
Steven David .................................................... Program Chair, National Security Studies Certificate
Mark Stout ...................................................... Program Director

Research Administration
Benjamin Ginsberg ............................................. Program Chair
Marianne Woods ................................................ Program Director

Writing & Science Writing
Brad Leithauser .................................................. Interim Program Chair
David B. Everett .............................................. Program Director, Writing; Acting Program Directors, Science Writing
Mark Farrington ............................................... Assistant Director, Writing
Melissa Joyce .................................................. Program Coordinator, Science Writing

Administrative Information

1.800.847.3330  advan@jhu.edu
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At the time of publication of the 2015-2016 catalog, additional academic programs (degree and certificate programs) are under program development and are anticipated to launch in the 2015-2016 academic year. A full list of academic program offerings may be found on the Advanced Academic Programs website: advanced.jhu.edu.
Enrollment Services

The Advanced Academic Programs Enrollment Services Office consisting of the Admissions Office and the Registration Office is located at the Johns Hopkins Bernstein/Offit Building, 1717 Massachusetts Avenue, NW, Suite 101, Washington, DC 20036-2001. It is open Monday through Thursday from 9am to 6pm and Friday from 9am to 5pm. Students may also reach the office by email: aapadmissions@jhu.edu or aapregistration@jhu.edu.

ADMISSIONS

Below are the general admissions criteria for all Advanced Academic Programs. Additional requirements specific to each program are listed in that program's section in this catalog.

Admissions Requirements

> Bachelor's degree from a regionally accredited US college or university. Applicants who receive their bachelor's degree in a country other than the US must have the US equivalency of a bachelor's degree from a regionally accredited institution. Programs require a minimum GPA of 3.0 on a 4.0 scale. Meeting the minimum GPA requirement does not guarantee admission. As detailed in the Student Status section that follows, an applicant with less than the required GPA may be admitted as a provisional student, on a case-by-case basis. A student admitted with provisional status must meet minimum grade requirements as specified by the program.
> AAP online application.
> Nonrefundable application fee of $75.
> Unofficial and Official transcripts are required for all undergraduate and graduate studies. Transcripts depicting fewer than 12 credits that were transferred to a different U.S. institution are not required unless pre-requisites are listed on them.
  • Unofficial transcripts must be uploaded to the online application as part of the application process and include name, school name, cumulative GPA, and degree confirmation (if applicable).
  • Official transcripts must be mailed or delivered in a sealed institutional envelope to the DC office or sent from the institution through a secured system such as SCRIPSAFE or Docufide.
> Course-by-course credential evaluation for all coursework completed outside of the US. Evaluations are waived only if the student received his/her undergraduate degree from a US institution, and the undergraduate coursework taken internationally was transferred to that institution. However, the official transcript is still required of the international school. (See sub-section entitled “Collegiate Level Coursework earned outside of the U.S.” for details.)
> The TOEFL or IELTS score report is required for international applicants who do not meet the criteria below. (See section entitled “English as a Second Language” for details.)
> Additional materials required by the chosen program as listed in that program’s section.

All application materials submitted to the Advanced Academic Programs become the property of Johns Hopkins University and will not be returned to applicants under any circumstance. Any misrepresentation or omission of information included as part of an application will constitute cause for cancellation of the application prior to admission, reversal of acceptance, dismissal or initiation of disciplinary action. Once the Admissions Office has received all required materials, it sends the completed application to the Admissions Committee.

Review Process

The Admissions Committee for the chosen program assesses the application and its supporting documents. All materials must be received prior to the Admissions Committee review. Academic background; personal, professional, and field-related experience and achievements; and any program-specific criteria are all considered in this review. Review times for completed applications range from approximately 3-4 weeks. If a decision is not reached by the Admissions Committee in time for the upcoming semester, the program will consider the applicant for the following semester. The Admissions Committees reserve the right to require that more than the minimum standards be met for admission to any academic program and may require additional materials of the applicant if deemed necessary to make an admission decision.

Graduate Records Examination (GRE)

Most of AAP's programs do not require GRE scores. Please check your program's page to determine whether you must send in a GRE score. Do not send in the GRE unless it is required by the program or the committee. If it is required, applicants will need to have the scores sent to AAP by mail. To send your GRE scores, please visit: ets.org/gre. Our institutional code is: 8747 (Johns Hopkins Adv Acad Programs).

International Applicants

Collegiate Level Coursework Earned Outside of the U.S.

Applicants who earned their post-secondary degree(s) in a country other than the United States are required to have a “course-by-course” credential evaluation with GPA performed by an outside evaluation service. Evaluations are waived only if the student received his/her undergraduate degree from a US institution, and the undergraduate coursework taken internationally was transferred to that institution. However, the official transcript is still required of the international
school. The following three credential evaluation services are acceptable: World Education Services (WES), AACRAO, or Educational Perspectives. Do not send transcripts from international institutions. The credential evaluation service will send us your transcript along with the evaluation. We will not review your application until both are received.

World Education Services: World Education Services (WES course-by-course evaluations must be sent to AAP officially. WES evaluations are received electronically. To send us a WES evaluation, please visit: wes.org. Our institutional code is: Johns Hopkins Advanced Academic Programs, 1717 Massachusetts Avenue NW, Suite 101, Washington DC 20036.

AACRAO: American Association of Collegiate Registrars and Admissions Officers (AACRAO) course-by-course evaluations must be sent to us officially. AACRAO evaluations are sent through the mail. To learn more, please visit: aacrao.org. Our institutional code is: Johns Hopkins University Advanced Academic Programs, Suite 101, 1717 Massachusetts Avenue NW, Washington DC 20036.

Educational Perspectives: Educational Perspectives course-by-course evaluations must be sent to us officially. To send us an Educational Perspectives evaluation, please visit: educational-perspectives.org. Our institutional code is: Johns Hopkins University Advanced Academic Programs, Suite 101, 1717 Massachusetts Avenue NW, Washington DC 20036.

English as a Second Language
International applicants must demonstrate English proficiency by meeting at least one of the following requirements:

> The applicant submits official TOEFL or IELTS scores.
> The applicant holds a post-secondary degree from an accredited U.S. institution.
> English is both the official language and the only language of instruction in the applicant’s native country.

TOEFL: Official TOEFL score reports must be sent to us in the mail. Photocopies or electronic TOEFL score reports will not be accepted. AAP requires a minimum score of 600 on the paper test, 250 on the computer-based test, and 100 on the Internet-based test. To send TOEFL scores, please visit: ets.org/toefl. Our institutional code is: 8747 (Johns Hopkins Adv Acad Programs).

IELTS: Submit IELTS results through their website at: ielts.org. Applicants should contact the test center where they took the test directly and request that test scores be sent electronically using the IELTS system. Please be sure to select “Krieger School of Arts and Sciences Advanced Academic Programs.” All IELTS test centers worldwide are able to send scores electronically. AAP requires a band score of 7.0.

Student Visas
Students admitted as degree candidates who plan to take courses onsite in the US, and who take at least three courses per semester, may request certification for an F-1 visa. Students for whom this may be a possibility should indicate “yes” on their admissions application at the appropriate checkbox regarding initiating the visa process. AAP international students on F-1 visas can only begin their program in the fall or spring semester. In order to maintain status on an F-1 visa, students in AAP must be enrolled in a minimum of three courses per semester, one of which can be an online course. The Admissions Office will assist in the certification process (aapadmissions@jhu.edu) which the student must complete with the Office of International Services. For more information, international applicants should see the frequently asked questions page for international applicants on the AAP website, advanced.jhu.edu/students/international-students.

Admissions Process
Applicants may apply throughout the year and begin study during any of the three semesters (summer, fall, spring). While applications are accepted year-round (summer, fall, spring) for all programs, all applicants are strongly encouraged to apply and complete the application process 4-6 weeks before the start of the desired semester. International applicants seeking a visa must submit all application materials three months prior to the start of the intended semester of study. Admission terms are limited to fall and spring enrollment for international students pursuing an F-1 visa.

After applicants have completed their application file it will be assessed by the program’s Admissions Committee. All materials must be received prior to the Admissions Committee review. Academic background, as well as personal, professional and field-related experience and achievements are considered in this review. Review times may vary significantly by program. If a decision is not rendered in time for an upcoming semester, the application will be reviewed for the following semester. When a decision has been reached, the applicant will be notified via US postal service for domestic applicants and via the ApplyYourself online application system. International applicants will be emailed their admission decision. All admission decisions are final.

Advanced Academic Programs accepts applications up to one year in advance of the intended semester of study. An applicant can only apply to one program at a time unless they are applying to an approved dual or combined program in AAP. The Admissions Office requires no deadlines by which an applicant needs to submit an application. After the Admissions Office receives a complete application, it is reviewed by the Admissions Committee for a decision. An incomplete application (including application fee) is valid for one year from the date submitted. Applicants who fail to submit required supporting materials within this period, and who wish to be considered for admission, must submit another application and fee and all required supporting documents.
Acceptance of Admission
Newly accepted students are directed to an Enrollment Decision form available through the electronic version of their official admission decision letter. Starting from the point of enrollment in the first course counted toward fulfillment of the master's degree or certificate program, the student has a maximum of five years to complete all course work. However, students must maintain continuous enrollment throughout the duration of time spent in the degree or certificate (see Continuous Enrollment section).

Deferral of Admission
Admitted students may defer the start of their studies for up to one year from the term of admission (example: a fall admit can defer until next fall; a spring admit can defer until next spring). Applicants need to complete the Enrollment Decision form which is available through the electronic version of their official admissions decision letter. If an admitted student does not file a deferral form or enroll, and wishes to enroll beyond the year of admission, the admitted student must submit another application and fee. A student who reapplies must satisfy admission and program requirements in effect at the time of reapplication.

Denial of Admission
All admission decisions are final. Decisions are made by the Admissions committee and are mailed to applicants. The Admissions Office cannot discuss the committee decision. In the case of denied admission, applicants must take at least one year to attempt to improve their qualifications before reapplying to the same degree or certificate program. Improvements can include (but are not limited to) taking the GRE, submitting a new writing sample or taking additional courses in a related field at a regionally accredited college or university. Please note that an improvement to the application or reapplication does not guarantee admission into the program. The applicant will need to reapply to the program by submitting a new application, $75 application fee, and submit any additional supporting documents.

New Student Orientation
Once admitted to Advanced Academic Programs, all students are encouraged to complete a web-based new student orientation at advanced.jhu.edu/students/orientation. This orientation provides guidance for students to understand administrative processes at Advanced Academic Programs and to learn about available resources. The orientation provides important steps for all AAP students to cover. The new student orientation is different from the "online orientation" for those students enrolled in online courses/programs. The new student orientation provides general information relevant to all students regardless of where they are—online or onsite. The online orientation provides specific information regarding the use of Blackboard and enrollment in online courses.

Change of Program
Students who wish to change to another degree program within the Advanced Academic Programs must fill out a “Change of Program” request form at advanced.jhu.edu/current-students/forms. Current students do not need to complete a new application, or fee, or send transcripts. Documents required by the new program, but not submitted previously, may need to be added. Students are not automatically admitted to a new program; their request is reviewed by the appropriate Admissions Committee according to the stipulations of the new program. There is no charge for the first Change of Program, but a $75 charge is administered to subsequent Change of Program requests. Tuition rates in AAP correspond to the respective academic discipline/program; therefore, changing programs may result in different tuition rates. Please note: Taking courses outside the program to which you are admitted does not guarantee admission to another program.

Admission to Other Divisions or Programs of the University
An admitted student in the Advanced Academic Programs who wishes to transfer to another school in the university or to a full-time program in the School of Arts and Sciences must apply to the appropriate school or the Arts and Sciences’ full-time programs. Admission to the Advanced Academic Programs establishes no claim or priority for admission to other divisions or programs of the university.

Student Status
Degree/Certificate Candidates
Qualified applicants are admitted as degree or certificate candidates and structure coursework toward a specific academic degree based on the program requirements with guidance from their advisor. To be admitted as a master’s degree or certificate candidate, an applicant must be in the last semester of undergraduate study or hold a bachelor’s degree from an accredited college or university. Select certificate programs in AAP are Post-Masters’ certificates and may also require the completion of a Masters’ degree (example: Post Masters’ Certificate in Sequence Analysis and Genomics). An applicant is admitted as a degree or certificate candidate after the Admissions Committee for that program reviews the completed application and determines eligibility. A degree or certificate candidate may be admitted provisionally if the Admissions Committee determines eligibility.

Provisional Student
Provisional students are admitted to this status because, in the view of the Admissions Committee, they do not fulfill academic requirements for admission as a degree candidate at the time of the application. Provisional students may be required to take specific prerequisite courses, and/or take a specific number of courses and complete them successfully in order to establish their eligibility to be admitted as a degree candidate.

During the time of this provisional status, students are held to grading criteria stricter than those required of degree candidates (see Grading System, Requirements). Provisional students who receive a grade of B- or below (B+ or below for the Writing and Science Writing programs) in any course cannot repeat
the course and are dismissed from the program. Please review your acceptance letter for additional criteria (the dismissal policy supersedes any variation listed on the acceptance letter). Conditions may apply regarding financial aid for provisional students—contact Financial Aid for specifics regarding eligibility. When the provision is met, the student’s status will be changed from provisional to degree candidate.

**Special Student**
A special student is one who would be eligible for admission as a degree or certificate candidate to the chosen program, but who is not interested in pursuing the credential. To be able to register for any Advanced Academic Programs course as a special student, a student must submit all required admissions documents for the program in which the student desires to take courses. Official transcripts for the highest degree attained may be required, along with other documentation. Special students are permitted to enroll in any courses for which they satisfy the stated prerequisites.

In the MA in Writing Program, special students must also obtain program approval for any course before registration.

As long as special students do not interrupt their studies for more than one year and remain in good academic standing, they can take up to 4 courses as a special student. A special student who does not remain in good academic standing may be dismissed from AAP. If more than one year lapses between registrations, special students are required to reapply (see below, Leave of Absence, Continuous Enrollment, Inactive, and Dismissed).

Prospective applicants interested in learning more about eligibility for special student status should contact the program director in the academic area of interest or refer to the program website.

Special students are welcome to apply to be accepted as a degree candidate at any time during their studies. The Admissions Committee for their program will determine if any courses completed thus far can count toward the degree. Program requirements and time limitations in effect when applying will guide the admission decision.

**Conditional Student**
A conditional student is an undergraduate student in the last semester of undergraduate studies. These applicants can be admitted with the condition that they successfully complete their undergraduate studies and submit an official transcript in English verifying degree conferral prior to registering for their second semester. Note: financial aid restrictions may apply to students who attempt simultaneous enrollment in graduate and undergraduate classes at separate institutions.

**Accelerated Undergraduate Students**
In some programs (Applied Economics, Biotechnology, Environmental Sciences and Policy, Global Security Studies, Government, and Public Management), current Johns Hopkins undergraduates may be allowed to accelerate their time to complete an AAP master’s degree. Applied Economics, Biotechnology and Government consider academically strong and eligible candidates from JHU’s undergraduate programs for the accelerated option. The Environmental Sciences and Policy program allows eligible, upper level students from the Global Environmental Change and Sustainability (GECS) major in JHU’s Department of Earth and Planetary Sciences at Johns Hopkins to begin taking limited course work in the MS in Environmental Sciences and Policy program prior to the completion of their undergraduate degree. Please contact the appropriate program director/advisor for further details.

**Waived and Replaced Classes**
In some programs, students may wish to request that a core course or prerequisite course be waived based on previously completed course work. Students who wish to waive a course must contact their program director. Supporting documentation such as copies of syllabi and course descriptions will aid the appropriate committee in making a decision in the best interest of the student. All waived core courses or prerequisite courses are replaced by electives or other courses so that students take the required number of courses to complete their degree.

**Advanced Standing**
Advanced Standing allows consideration for seasoned professionals with accomplishments in a field or those who have graduate-level coursework from an accredited college or university to be exempt from taking up to two courses towards degree completion. This policy applies to the programs listed below only and the request for consideration must be made at the time of application. Applicants approved for advanced standing will receive official notification in their acceptance letter. More information regarding specific qualifications and application requirements for advanced standing can be found on the respective Admissions Requirements web pages for each program.


**Transfer Credits**
Graduate courses taken at any institution other than The Johns Hopkins University are not accepted as transfer credits, and they cannot count toward graduate degree requirements in the Advanced Academic Programs, unless specific approval is given in writing from the program director. (See Advanced Standing above.)

**Leave of Absence, Continuous Enrollment, Inactive, and Dismissed**

**Leave of Absence**
Students who anticipate that they will not enroll in classes for a period of two semesters or more, but who believe that they will resume their studies, must complete a Request for Leave of Absence Form at advanced.jhu.edu/current-students/forms. In the case of medical leave or leave due to military
service, students must provide relevant documentation (which may include service orders or medical documentation) to aapregistration@jhu.edu. The appropriate program advisor, working with the Enrollment Services staff, will consider the request and will inform the student in writing of the decision. Students who are granted a leave of absence must contact AAP’s Registration Office prior to resuming their studies at the end of the allotted leave time. If granted a leave of absence, students automatically receive an extension for the same period of time. All other criteria listed in the Time Limitation section remain in place. A Leave of Absence is granted for up to two years. A leave of absence may not be granted to a student who is currently on thesis continuation. A student who has received an approved Leave of Absence does not have to continuously enroll at AAP during the approved leave period (see continuous enrollment policy).

Continuous Enrollment
All degree and certificate students accepted for fall 2013 and beyond will be charged a non-refundable $75 fee if they do not enroll in at least one course in the fall or spring semesters. See the frequently asked questions regarding continuous enrollment on the AAP website: advanced.jhu.edu under the Current Students page. Further details regarding the continuous enrollment policy are also described in the Tuition and Fees section of the catalog.

Inactive
With the exception of those on a leave of absence, students who do not enroll for more than two semesters will lose their active status. The student is considered to have withdrawn from the program. To resume taking courses in the Advanced Academic Programs, students must contact the AAP Registration Office and/or reapply by submitting a new application form, a new application fee, and any new application materials required. Reapplying students are subject to the admissions and program requirements in effect at the time of the new application. Acceptance for inactive students is not guaranteed, and courses taken prior to the interruption of studies may not count toward degree requirements. Time limitation still applies, see the Time Limitation policy on page 17.

Dismissed
Provisional students (degree and certificate) who do not earn a minimum grade of B in any course taken in the Advanced Academic Programs while on provision are dismissed from their program. Fully admitted degree candidates must adhere to grade requirements in order to remain in the program. Degree and certificate students who earn two grades of C or lower, are automatically dismissed from the program. Any degree or certificate student who does not continuously enroll is deemed as a withdrawal and will be dismissed. Dismissed students may reapply to another degree or certificate program in Advanced Academic Programs immediately; however, admission is not guaranteed. A dismissed student must wait one year from the date of dismissal to reapply for admission to the same degree or certificate program from which the student has been previously dismissed. Readmission is not guaranteed.

REGISTRATION

The Integrated Student Information System (ISIS) provides students access to financial aid, billing, and enrollment records in one location with the same interface. Strong authentication security assures confidential access to information by students using any popular web browser and their JHED login ID and password.

New and active students can register for courses online using the ISIS at isis.jhu.edu.

Students can also register using the online Add/Drop form, or the paper Registration Form. The form can be found at advanced.jhu.edu/registration. If you complete the paper form, please fax to 202.452.1970 or email a PDF file to aapregistration@jhu.edu.

A completed registration requires payment or verification of how payment is to be made. Students who have not completed financial aid forms, or have unpaid bills from a previous semester/term, will have a “Hold” in the registration process and will not be allowed to register until Student Accounts processes payment and removes the “Hold.” Several business days are required to complete these processes.

Students are asked to be sure they have fulfilled the appropriate prerequisites for each course before registering. It is the student’s responsibility to make sure the requirements are met and appropriate grades are in place in order to register and advance through their academic program. Once a registration is received, allow one to three working days before checking your confirmation online at isis.jhu.edu.

Ways to register
1. Online at isis.jhu.edu
2. Online add/drop form
3. Mail paper registration form to Johns Hopkins University, Advanced Academic Programs, Enrollment Office, 1717 Massachusetts Avenue, NW, Suite 101, Washington, DC 20036
4. Fax paper registration from to: 202.452.1970
5. Hand-deliver paper registration form to AAP at any of the three locations
6. Email completed registration form to aapregistration@jhu.edu

Each semester the course schedule is posted at advanced.jhu.edu/registration. The course schedule is available only online and students are encouraged to enroll early for best selection.

Proof of Immunization Prior to First Registration

The District of Columbia requires all students under the age of 26 to submit an Immunization Form. The form can be found at advanced.jhu.edu/current-students/forms. This requirement
may be waived for students if they meet both of the following criteria:

1. The student is in a fully online program that does not have optional or mandated residency requirements, classes or activities that may be taken in DC.
2. The student does not currently live in DC, nor does he/she plan to move to DC, or any contiguous state, including Maryland, Virginia, Delaware, Pennsylvania or West Virginia. If he/she moves to DC or one of the aforementioned states, it is the student's responsibility to complete the Immunization Form and conform to the immunization requirement prior to the move. This form can be found at: http://advanced.jhu.edu/current-students/forms/

Late Registration

Registration is open for approximately two months prior to the start of a semester/term. Late registration starts the day after registration ends and requires a $150 fee for returning students. Check the Academic and Registration Calendar for late registration deadlines. Students registering late should check the Refund Schedule.

Adding/Dropping/Changing to Audit

Students wishing to add, drop, or audit a course can use the online add/drop form or the paper add/drop form. Both can be found can be found on advanced.jhu.edu/current-students/forms. Students on financial aid should consult the Office of Financial Aid before making these types of changes. Those using the paper form, please submit to the fax or email listed on the form. Deadlines for completing this procedure are featured in the academic calendar.

Faculty cannot initiate, complete, or process Add/Drop changes. Students who register but never attend or stop attending a course but do not officially drop the course will be given an F grade for the course and will not be given a refund. Students who register for a course, but never attend or stop attending, and later drop, are subject to the refund schedule at the time of their drop. All registered students are subject to the refund schedule, regardless of attendance. Requests to drop a registration must be received by email or fax to be processed for the appropriate refund. Refunds will be based on the date the request to drop is received by the Advanced Academic Programs Registration Office. See the AAP refund schedule posted for each semester on the web at http://advanced.jhu.edu/current-students/refund-schedule/

Course Enrollment Limits

All AAP courses have enrollment limits. It is not always possible to offer additional sections of oversubscribed courses. A waiting list option is available in ISIS during the registration period for most courses with full enrollment.

Completion of Prerequisites

The prerequisites for each course can be found in the program sections of this catalog. It is the student's responsibility to check the prerequisites for each course and register appropriately. A student may be administratively dropped if he/she has not met the stated prerequisite.

Course Load

Students who are working full time are advised that two courses per semester is a challenging academic load. Students who elect to register for more than two courses should be working less than full time to successfully manage three or more courses per semester. Students expecting to take three or more courses (except international students seeking an F-1 visa who are required to be in a full-time classification) should consult their program director/advisor prior to registration to ensure their course load is appropriate for their individual case.

Some programs require permission from the academic advisor before enrolling in three or more courses. Students have five years to complete their academic program from the start of their first graduate-level course within their academic program, and it is highly recommended that students take the appropriate time to do well in all courses.

Auditing a Course

Students may register as auditors. Auditors receive no credit for the course and a grade of “AU” is placed on their official transcript. There is no reduction of fees or tuition when auditing a course. Although regular attendance is expected of auditors, they are exempt from quizzes, examinations, and other assigned work. Students who take courses for credit are given enrollment priority over auditors. Students who are enrolled for credit but wish to become auditors during the active semester request the necessary change by filling out an online Add/Drop form. Please refer to the Academic and Registration Calendar for the deadline by which to request to audit a course. Auditors are ineligible to change their status to credit seeking after the start of the semester.

Tuition Payment

In order to complete your registration, a verification of payment method of all tuition and fees is required for each semester at the time of registration.

AAP students can make payments by check, credit card, employer contract (employer authorization), tuition remission, or financial aid. In all cases, students are not permitted to register if there is a balance due on their account from a previous semester.

Employer Contract

Students whose tuition is paid by employer billing authorization (employer contract) should begin processing requests with their employers well before the start of registration. Send a copy of the employer contract by Email or fax to AAP Registration Office at (202) 452-1970 or aapregistration@jhu.edu. Students using an employer contract are financially responsible for any tuition and fees not paid by the employer.

Employer Reimbursement

Students who are requesting employer tuition reimbursement must pay for the course at the time of registration with their own funds and request reimbursement from the employer at
the appropriate time.

Financial Aid
Students who plan to request financial aid to cover their tuition should submit the appropriate paperwork in ample time prior to registering. Go to jhu.edu/finaid/part_time.html or email aapfinaid@jhu.edu. Students must take a minimum of two courses to be eligible for Federal Financial Aid. Students may also look at alternative loans for a single course registration. The JHU Policy for Satisfactory Academic Progress requires all students to advance in their program with appropriate grades and within the appropriate timeline to continue receiving financial aid. The financial aid code for JHU/AAP is E00473. See full Financial Aid section in the catalog for details regarding Satisfactory Academic Progress required for compliance for financial aid.

JHU Tuition Remission
Students receiving tuition remission benefits from Johns Hopkins University should read the contract carefully. Call the Center for Training and Education at 443.997.6800 to address any questions. Please note that students are financially responsible for dropped courses paid for with tuition remission and any associated fees, if applicable. See JHU’s Benefits website for specific information regarding tuition remission: benefits.jhu.edu/tuition/remission.cfm

Registering for Courses in Other JHU Programs
With advisor approval, AAP students may take up to two comparable courses and may apply these courses from other JHU programs toward their master’s degree or certificate.

Interprogram
AAP students wishing to count a course outside their program toward their degree need to obtain advisor permission, unless the course is cross-listed in the Course Schedule (advanced. jhu.edu/registration) or otherwise listed as part of shared concentrations. To obtain advisor approval, students must forward to their advisor a written request which includes documentation of course description and any other information that may be helpful in assessing the course's applicability to a student's program. The student's advisor or academic program director then determines if the requested course is appropriate and whether the student is eligible to take it.

Interdivisional Registration for AAP Students
AAP students who wish to take a course at another Johns Hopkins school/division must submit a request to the AAP registration office using the online add/drop form or a paper add/drop form. To ensure that there is time for review and approval from other divisions within Johns Hopkins, the request must be received in the AAP Registration Office no later than two weeks before the first day of class. Advisor approval is required to allow non-AAP courses to count toward the AAP degree (excluding curriculum that requires courses from other JHU divisions). To obtain advisor approval, students must forward to their advisor a written request which includes documentation of the course description, number of credits, and any other information that may be helpful in assessing the course's applicability to a student's program. The student's advisor then determines if the requested course is appropriate and whether the student is eligible to take it.

Interdivisional Registration for Non-AAP Students
Non-AAP students in other divisions of Johns Hopkins may take up to two courses in AAP, if permitted by their home division, and with permission of the AAP program director or associate dean. Non-AAP students must complete the necessary paperwork and/or procedures required by their Home School/Division. Interdivisional requests are processed by the AAP registration office during late registration, on a space available basis, to allow AAP students first eligibility into courses. Interdivisional registration is not guaranteed. School of Medicine students should contact the AAP registration manager for assistance with interdivisional registration.

International and Off-Site Courses
Some AAP programs may offer courses at an international location or at a site that is not on the Johns Hopkins University premises. These courses may have different registration deadline requirements and refund schedules as well as additional registration paperwork and fees. Students should check the website and ISIS messaging carefully for these differences.

GRADUATION REQUIREMENTS

Application for Graduation
Students planning to complete their degree requirements at the end of the semester for which they are registering must notify the AAP Registration Office of their intentions by completing the online graduation application form found in ISIS. This form should be completed when registering for the last course(s) needed to complete the degree; it initiates the graduation review process without which a student cannot be cleared for graduation. The Registrar’s Office will periodically correspond with the student using the JHU email account address provided to all students in order to provide important information about administrative details, events, and deadlines. There is a $100 graduation fee to be paid at the time of application for graduation. This fee must be paid once for every degree earned.

The application for graduation form is valid for only one semester. If students do not complete their degree requirements during the semester expected, they must resubmit the application form while registering for the next semester. However, students are charged the $100 graduation fee only once.

Completion of Degree Requirements
The Johns Hopkins University confers degrees three times a year (August, December, and May) to all students who have completed requirements during the spring, fall, or summer semesters. The university-wide commencement ceremony and the master’s degree ceremony take place once a year in May at the Homewood campus in Baltimore. Diplomas are mailed to graduates at the address given on the graduate application found online in ISIS. The conferral date is the date that will appear on a graduating student's transcript.
ALUMNI BENEFITS

Advanced Academic Programs alumni are always welcome to register for courses in AAP. Having alumni in courses boosts the academic rigor, knowledge, and experience in the classroom. To promote this interaction and to provide opportunities for alumni to take courses they missed or that will help them remain current in their fields, AAP offers the Alumni Tuition Benefit Program.

An alumni registration form is posted on the website for alumni. Interested alumni will select either a full-credit, full-tuition option or a non-credit, reduced-cost alumni benefit option. They will be required to complete the alumni registration form so we have updated information, but they will not be required to submit a resume, a writing sample, letters of recommendation, transcripts, or any other usual application materials.

Full-Tuition Option (with credit): Alumni who have applied through the method noted above will be able to register for an approved course as a special student. Their registration will be processed in a timely manner during regular registration or late registration. They will be in competition for seats along with current students (first-come, first-served). The course will appear with a grade on the transcript.

Space-Available Tuition Benefit (non-credit, audit): Alumni interested in this option will be eligible for a 50 percent reduction in tuition in any course for which they qualify, on a space-available system, in a participating program. The course will appear with an AU, to indicate the audit status, on the transcript.

Qualification Required: In all cases above, alumni can enroll only in courses for which they qualify. A program may elect to limit the courses open to alumni or they may reserve a certain number of slots for current students.

ACADEMIC REGULATIONS FOR ONLINE COURSES

Online Orientation for Online Students

All students taking their first fully online AAP course will be required to participate in an online orientation course before the term starts. Students will learn how to navigate, collaborate, and communicate in a fully online course. The orientation provides valuable hands-on experience with the course management system. Important information regarding the technical requirements and support resources available will be given in the orientation. Students should expect to devote one to four hours to the orientation, but it may be spread out over several days. Information about where and how to take the orientation course will be provided to students by email.

Returning students are welcome to participate and to review techniques and tools. All students are encouraged to revisit the orientation to test for access to online library resources in the Library Module.

Online Library Access

AAP provides online library resources to all students. New online students are required to obtain access as part of the orientation and are supported in this process. Instructions for remote library access can be found at library.jhu.edu/services/computing/remoteaccess.html.

Online Class Structure

AAP online courses are “asynchronous.” Students access course materials and discussion at individually desired times. Students share learning actively through the web-based course site with readings, assignments, group activities, and threaded discussions as guided by their instructor. Course format and structure promote active and interactive learning.

Online Bookstore

AAP has partnered with an online bookstore, MBS Direct, to service online students as well as students enrolled in on-site courses. MBS Direct offers competitive pricing, new and used books, and buy-backs from their large distribution center. Students can access the bookstore at mbsdirect.net approximately four weeks prior to the start of each semester to purchase their texts. Questions about MBS Direct or its services can be directed to the Customer Service Center at 800.325.3252 or vb@mbsDirect.net.

Residency Requirement

Some programs are offered fully online, and some have no online courses. Still others have an on-ground residency requirement in addition to courses offered online. Each program has specific requirements, and it is the student’s responsibility to check with their program advisor to ascertain the requirements pertaining to their program.

GRADING SYSTEM

Scale

The grading scale for students enrolled for credit is A+, A, A-, B+, B, B-, C, and F. An I (Incomplete) grade is assigned by the instructor who has given the student permission to delay completion of specific course work for a justifiable reason for a specific amount of time. W (official Withdrawal) and AU (Audit) are requested by the student and cannot be assigned by the instructor. A grade of F indicates the student’s failure to complete or comprehend the course work and therefore does not count toward the courses needed for completion of the degree. An F grade is not removed from a student’s transcript even if a course is repeated. AAP does not calculate grade point averages and a GPA will not appear on the transcript.

Requirements

If a degree candidate receives a grade of C or below in a core course, the student must repeat that course. Even if the course is repeated, the original grade will remain on the student’s
transcript, and the student may not receive another grade of C or below. For specific guidelines on what courses are considered core and/or required, please review the curriculum requirements listed for your program in this catalog or on the AAP website.

Special students (those who satisfy all requirements for admission to degree candidacy but who choose not to seek a degree) are held to the same performance standards as degree candidates. Provisional students cannot continue in a program if they earn a grade of B– or below (B+ or below for the Writing or Science Writing Programs) in any course taken while they are in provisional admissions status.

Probation and Dismissal
Degree candidates who receive a grade of C or below are on academic probation. See “Requirements” section above for details and clarification regarding grade requirements for degree, special, and provisional students. When a course is repeated, both the original grade and repeated grade appear on the transcript. The degree candidate receives credit only once for the course; however, the original grade of C (or below) places the student on probation. If a degree candidate receives a grade of C in an elective course, the course need not be repeated, and the course can be counted toward degree requirements.

Degree candidates who receive a second C or below in either a repeated core course or any course taken in the program will be dismissed from the program.

Students dismissed may apply to another program in Advanced Academic Programs immediately. Admission is not guaranteed. A dismissed student must wait one year from the date of dismissal before reapplying for admission to the program in which he/she has been dismissed. Readmission is not guaranteed.

Incomplete
A designation of I (Incomplete) is assigned when a student fails to complete a course on time for valid reasons as determined by the instructor. A student requests a status of Incomplete from the instructor and submits a required form. The Request for Resolution of Incomplete form can be found at advanced.jhu.edu/current-students/policies/grading-policy. The student notes the reasons for requesting the Incomplete and details the plans for resolving it. The student and instructor sign the form. Instructors send the completed form to the AAP Registration Manager.

An Incomplete is granted at the instructor’s discretion, and conditions for absolving it are established by the instructor. It is the student’s responsibility to submit all work at the agreed-upon time. If a student does not complete the incomplete course, the “I” will convert to an “F” grade 60 days after the beginning of the following semester in which the student enrolled for that course.

Withdrawal
The W (Withdrawal) grade signifies an official withdrawal from a course that has been approved by the Advanced Academic Programs Registration Office. The student initiates the withdrawal by completing an online add/drop form or sending in a paper add/drop form. The Add/Drop form can be found at advanced.jhu.edu/current-students/forms. A “W” cannot be assigned by the instructor. Students who register for a course, but never attend or stop attending, and later drop, are subject to the refund schedule at the time of their drop. All registered students are subject to the refund schedule, regardless of attendance. For further information see advanced.jhu.edu/ registration, and then select Step 4: Paying For Your Courses.

Academic Standing and Conduct
The university reserves the right to dismiss at any time a student whose academic standing or general conduct is deemed unsatisfactory.

Academic Integrity
Graduate students at Johns Hopkins are expected to understand the ethical standards of the university, hold the highest standard of integrity for their work, and avoid academic dishonesty in all forms. Ignorance of ethical rules is no excuse for cheating. It is the further responsibility of every student to report to the instructor or their program's director any suspected violations of academic ethics by peers. Enforcement of our Code of Conduct is a shared responsibility and should not depend on the university alone. We all celebrate the rigor of a Johns Hopkins education, but that rigor loses its meaning if students cheat. Students who violate this Code of Conduct face a range of penalties, including failure of a course, permanent university transcript notice of an ethics violation, loss of a degree, or expulsion from the university. Please see the Code of Conduct for procedures and responsibilities. This pamphlet is available at all three Advanced Academic Programs sites and is available online at advanced.jhu.edu/current-students/policies/code-of-conduct/. At publication time for this catalog, the Advanced Academic Programs was considering changes to the Code of Conduct. Any revised code will be announced and posted at the link above.

Ethics violations of any kind are taken seriously and may result in dismissal from AAP’s programs. The best way you can keep yourself from committing an act of plagiarism is to be properly informed. At a minimum, please remember that any words taken verbatim from a source must be cited and contained within quotation marks. Even if you have paraphrased an idea from a source you must provide the appropriate citations. Ignorance of these principles will not be an acceptable excuse for violation of the policy.

For further information and assistance in determining when and how to properly cite your sources, please link to an excellent resource provided by the Eisenhower Library of Johns Hopkins University at library.jhu.edu/researchhelp/index.html. An equally useful resource with clear and specific definitions of plagiarism can be found at turnitin.com.
Grade Disputes
If a student does not agree with the grade an instructor assigned in a given course, the student must contact the instructor first to attempt to resolve the disputed grade. If the instructor and the student are unable to reach an agreement, the student may present his/her argument to the program committee in writing with supporting facts and documents. The program committee which may include other members of the AAP faculty may solicit the instructor's evaluation in writing or members may ask the instructor and/or the student to appear before them. The committee then determines whether the disputed grade should be changed or retained and informs the student and the instructor of its decision. The committee's decision is final. Grade disputes must be submitted to the program committee no later than the last day of classes for the following semester. Grade disputes are not allowed after the student graduates.

Time Limitation
Students must complete all academic work in a master's degree or certificate program within five years, calculated from the start of the first course that counts toward the degree (including time spent on continuous enrollment). Continuous enrollment does not stop or extend the time limitation requirement. This time limit includes any courses taken at another Johns Hopkins school/division that have been approved to count toward the degree or certificate.

If necessary, students may request from their program committee an extension of time to complete their program beyond the five-year limitation. An Extension of Time Request Form is available at advanced.jhu.edu/current-students/forms. If an extension is granted, it will be communicated in a letter, and the five-year limit increased by the time included in the extension. All other criteria apply, including continuous enrollment should students fail to enroll in courses without approved leaves. An extension may be granted for a semester up to a full year, and in rare circumstances for two years.

ACADEMIC STRUCTURE

Advisors
Each student accepted into a degree program or certificate is assigned an academic advisor who is available for consultation regarding the student’s program of study. A student advisor's name and email address are provided on their admissions decision letter. Advising is available year-round. Consultation takes place by phone, email, Internet, or in person by appointment. Please see the program sections in this catalog for specific program advisor information.

Course Schedule
Courses in all programs are offered in the summer, fall and spring terms. The summer term permits a number of alternative formats; some courses meet intensively for six weeks, others for as many as 12, 13 or 14 weeks are possible, and some programs have two summer terms. The fall and spring terms may have 13 or 14 weeks for regular classes depending on the program. The spring semester includes a three-week intersession for courses offered at the beginning of January to the end of the month. Similarly, the summer term includes a May intensive schedule available in select programs. These intensive semester formats allow students to complete special interest courses, such as travel courses, as well as regular courses offered in compressed format.

Course Numbering System
Advanced Academic Programs courses are numbered in the following form:

> > 601 indicates the course number—in this example Geological Foundations of Environmental Science
> > 51 indicates the section number and location where the course is offered—i.e., sections 01–09 are offered at the Homewood campus in Baltimore; sections 51 to 59 are offered at the Washington, DC Center; sections 71–79 are offered at the Montgomery County Campus in Rockville; and sections 81–89 are offered online. Section 91/92 indicates an international or off-site course.

Course Credit
In keeping with the practice of other research universities, credit hours are not assigned to graduate-level courses (600-level and above) in the Krieger School of Arts and Sciences. However, if credits are required for transfer purposes, all courses at the 600-level and above carry the equivalent of four credits, and a transcript guide noting this can be included from the JHU Registrar's Transcript Office when a transcript is requested.

Enrollment/Degree Verification
Enrollment Verification provides proof of enrollment for a student’s financial lender, insurance company, sponsor, etc. Enrollment verifications can be obtained through ISIS. Please expand the Registration menu and choose the last option listed on the menu. Verifications may also be placed through the National Student Clearinghouse. If you have any questions regarding enrollment verifications, please contact the Homewood Registrar’s office by phone at 410-516-8080.

Transcripts
The transcript is part of the student’s permanent record at the university. No grade may be changed except to correct an error or to replace an Incomplete with a grade. Active students can request a transcript through ISIS. Please expand the Registration menu and choose the last option to request
courses are taken outside of a student’s program of study, the program of study in which the student has been admitted. If disciplines. Students will be charged tuition based upon the academic program of study and varies across AAP. All tuition in the Advanced Academic Programs is determined according to academic program of study and varies across AAP. The application fee is $75 for all programs. The application fee from any academic program will have their application fee waived. Please contact the Admissions Office to waive your fee. The application fee is $75 for all programs. The application fee from any academic program will have their application fee waived. Please contact the Admissions Office to waive your fee.

Second Master’s Degree
After receiving a master’s degree from the Advanced Academic Programs, students may continue in a second program if prerequisites for that program are fulfilled. To receive a second master’s degree from the Advanced Academic Programs, all course requirements for the second program must be satisfied. The student may count up to three courses taken as part of the first degree toward requirements of the second. However, the relevant program committee must approve the course(s) as appropriate to the plan of study, and the course(s) must satisfy the requirements of the second degree. The course(s) also must fall within the five-year limit for the second degree (i.e., the second degree must be completed within five years, counting from the beginning of the first course accepted toward the second degree).

To apply for a second master’s degree, the student must submit a new Advanced Academic Programs application form, an application fee (waived if previous master’s degree was earned within the past year), and any additional admissions materials required by the second degree program.

Applying Courses from a Certificate toward a Degree in Advanced Academic Programs
Programs within AAP may allow courses earned and applied toward a graduate certificate to be applied toward a graduate degree. In most instances up to three courses may be applied from an AAP certificate program toward a degree. Contact the program director of the respective program for details, conditions, and approval.

TUITION AND FEES
Full course tuition is due at the time of registration. All other fees are payable as noted below. Fees are not refundable. If a student registers for a course but does not attend OR officially drop/withdraw from the class, the student remains financially responsible for the tuition and fees associated with the course.

Application Fee
The application fee is $75 for all programs. The application fee must be submitted with the application and is not refundable under any circumstances. Johns Hopkins University alumni from any academic program will have their application fee waived. Please contact the Admissions Office to waive your fee.

Tuition
All tuition in the Advanced Academic Programs is determined according to academic program of study and varies across AAP disciplines. Students will be charged tuition based upon the program of study in which the student has been admitted. If courses are taken outside of a student’s program of study, the student will pay the tuition rate in effect for the program in which the course is taken. Restrictions apply for how many courses may be taken outside of a student’s academic program and applied toward the degree (see section regarding registering for courses in other programs in AAP and outside of AAP). For a full tuition list for 2014-2015 (degree and certificate programs), visit: advanced.jhu.edu/registration/tuition-and-fees/index.htm

Course Fees
Some courses require, in addition to tuition, field trip, laboratory, technology, materials fee or other related fees. These fees, specified in the Course Schedule (advanced.jhu.edu/current-students/course-schedule) for each term, are payable at the same time as the regular tuition charges and are nonrefundable.

Technology Fee
All fully online and blended courses in AAP require an additional technology fee of $150 per course. This fee applies to all students registered in online classes and it is not refundable.

Continuous Enrollment Fee
All degree and certificate students accepted for fall 2013 and beyond will be charged a non-refundable $75 fee if they do not enroll in at least one course in the fall or spring semesters. January intersession, May intensive, and summer sessions have been excluded from this requirement. To avoid additional administrative steps later, students are strongly encouraged to adhere to the continuous enrollment policy no later than the end of drop/add period each semester.

The continuous enrollment fee of $75 is charged for each term you are not enrolled in a credit course (see excluded semesters above). Continuous enrollment entitles students to advising, career services, and use of the Johns Hopkins facilities, including library facilities. AAP students will still have a maximum of 5-years to complete all degree requirements applied toward graduation. Exemptions from the continuous enrollment policy will be granted only for documented medical emergencies, approved leave of absence, or military service. Requests for exemption to the policy should be made to aapregistration@jhu.edu with supporting documentation. Those requesting an official Leave of Absence should complete the online form at: advanced.jhu.edu/students/forms/leave-of-absence.

The continuous enrollment fee is non-refundable. Students can contact aapregistration@jhu.edu with any questions regarding continuous enrollment.

Thesis Continuation Course
Students who are in a thesis course and do not finish the thesis in the semester in which they enrolled for it must pay a thesis continuation fee of $500 for each subsequent term (including summer) until a final grade has been submitted. Thesis continuation is relevant only for students currently in the process of completing a thesis and need more time to finish the thesis. Thesis continuation has a course number in
the AAP schedule of classes and can be registered for through ISIS. Thesis continuation and continuous enrollment are different. A student working on their thesis should not complete the continuous enrollment registration but rather the thesis continuation course. This fee paid allows students to continue using university facilities such as libraries and the Johns Hopkins Enterprise Directory (JHED).

Graduation Fee
The graduation fee is $100, payable upon receipt of a bill (through your JHU email account) from the Student Accounts office. Student Accounts sends this bill upon submission of the application to graduate. Billing schedule is subject to change without advanced notice. However, any student who graduates must pay the $100 graduation fee.

Refund Policy
Students may elect to withdraw from one or more course(s) for a variety of reasons. Refunds apply only to the tuition portion of a student's charges, excluding the field trip, lab, or technical fees, and are calculated based on the date the students' request to drop or withdraw is received by the Advanced Academic Programs Registration Office, The Johns Hopkins Bernstein/Offit Building, 1717 Massachusetts Avenue, NW, Suite 101, Washington, DC 20036-2001. Such a request can be made by using the Add/Drop form found at advanced.jhu.edu/current-students/forms. Complete the form online, or fax the form to the Registration Office at 202.452.1970. Telephone withdrawals are not accepted. Instructors or advisors never authorize or process withdrawals, though it is certainly courteous to inform the instructor of the intent to withdraw. Refunds are not granted to students suspended or dismissed for disciplinary reasons.

Students who drop a course before or on the deadline for a 75% refund will not have that course listed on their official transcript. Students who drop a course after the deadline for a 75% refund (receiving a 50% refund or less) and before the end of the semester will receive a W on their official transcript, indicating withdrawal from a course. The refund schedule for each semester is posted on the web at advanced.jhu.edu/registration (choose Step 4: Paying for Your Courses).

Refunds are made in accordance with the schedule listed below and are updated on the web for each semester/term (jhu.edu/registration). If you withdraw after your registration has been processed, the refund to which you are entitled depends on the date your request is received by the Advanced Academic Programs Registration Office. Onsite courses (e.g. international or regional) may be subject to a separate refund policy. Courses offered by other JHU divisions are subject to that division's refund schedule.

In the case of rare or exceptional personal medical situations or personal military requirements, a student may request to appeal the standard AAP refund schedule/policy. Refund policy appeals must be submitted in writing (and received) by the Advanced Academic Programs Registration Office in Washington, DC no later than the last day of classes of the very next semester/term. All supporting documentation and/or a thorough written explanation for the appeal must be included. The appeal will be reviewed by the Associate and Assistant Deans of AAP. Review times may vary depending upon the complexity of the appeal. Average review times for appeals range from four to six weeks from the date received. All decisions are final.

Refund Schedule

- Prior to 8 days before the start of the term — dropped at 100% (military personnel see * below)
- Eight days before the first class and prior to the 2nd week of class — dropped at 90%
- Second week of class and prior to the 3rd week of class — dropped at 75%
- Third week of class and prior to the 4th week of class — dropped at 50%
- Beginning the fourth week of classes, courses will be withdrawn ("W" appears on transcript)
- Fourth week of class, prior to the 6th week of classes — withdrawn at 25%
- Beginning the 6th week of class — withdrawn with no refund

*Students utilizing military benefits for tuition support may receive a 100% refund up to the start of the term for dropped courses. Students utilizing military benefits must comply with all other dates in the above stated refund schedule. All other students (i.e. non-military students who are not utilizing military benefits) must adhere to the above stated dates without exception.

Students who are enrolled at The Johns Hopkins University for the first time and who are receiving federal student aid are subject to a separate refund policy during their first semester of enrollment. For further information, contact the Financial Aid Office, jhu.edu/financialaid. Also, some AAP programs may offer courses at an international location or at a site that is not on the Johns Hopkins University premises. These courses may have different registration deadline requirements and refund schedules as well as additional registration paperwork and fees. Students should check the website and ISIS messaging carefully for these differences.

JHU LOCATIONS AND STUDENT SERVICES

The Advanced Academic Programs of the Krieger School of Arts and Sciences are offered on the Homewood campus in Baltimore; the Montgomery County Campus in Rockville; the Washington, DC Center; and online. Distances between the various AAP sites are considerable, and the university does not provide transportation between these sites, although public transportation may be available. The educational and student facilities and services provided at each location are described below.

The Johns Hopkins University portal at my.jhu.edu is the starting place for students and faculty and offers a one-stop site for Johns Hopkins news, information, and technology resources.
The primary goal of the portal is to simplify and centralize access to JHU services and content. Logging in to the portal requires activation of a Johns Hopkins University Enterprise Directory (JHED) login ID and password. The JHED login ID and password are also used to access the Integrated Student Information System (ISIS) at isis.jhu.edu, where students can register for courses, check grades, and view and pay bills. JHED authentication is also needed for remote access to the JHU Sheridan Libraries and other campus resources.

New faculty and students can go to my.jhu.edu to search for their name in the JHU directory and discover their personal JHED login ID. Click the "First time Login" tab and follow the instruction to activate a new account. For additional assistance, the Hopkins Information Technology Systems help desk can be reached at 410.516.HELP (410.516.4357).

Students can visit advanced.jhu.edu/students for information on student services at the various campus locations. Also located here are the steps for setting up a Johns Hopkins Email account. All official university information will be sent to the student’s JHU email address.

Homewood Campus
Library Services
The Sheridan Libraries encompass the Milton S. Eisenhower Library and its collections at the Albert D. Hutzler Reading Room in Gilman Hall, the John Work Garrett Library at Evergreen Museum & Library, and the George Peabody Library at Mount Vernon Place. Together these collections provide the major research library resources for the university. The Sheridan Libraries also provide a rich array of resources and services including research consultation, instructional services, and interlibrary loan services for part-time and full-time students. The Milton S. Eisenhower Library is the university’s principal research library and the largest of a network of libraries at Johns Hopkins. The JCard serves as an ID and library card in the JHU libraries. Students who are Johns Hopkins employees at locations other than the Homewood campus use their divisional library or library/ID card. For more information on current hours of operation, parking, and services, and to get started using the resources, please visit the libraries’ website: library.jhu.edu.

Online Access to Library Resources
Johns Hopkins University provides several options through which Johns Hopkins students and faculty can access library resources from any internet-connected location. For information on how to access these online resources when off-campus, please visit library.jhu.edu/services/computing/remoteaccess.html. For a list of resources, visit the library homepage at library.jhu.edu.

CIRLA (Chesapeake Information and Research Library Alliance)
CIRLA is a program allowing Johns Hopkins faculty and graduate students to go in person to a participating library in the region and borrow materials. A JCard must be presented to apply for CIRLA privileges. For participating libraries and instructions for borrowing, visit library.jhu.edu/services/circulation/otheraccess.html.

Computers
The range of Homewood IT services, equipment, and instruction can be found at it.jhu.edu. This website serves as a repository for all IT-related information at Johns Hopkins. You will find an abundance of useful information within this site, including an overview of the IT organization, its projects and services, support for applications and general questions, and news about emerging technologies and strategic initiatives. Students may also wish to learn more about computer facilities at the Homewood campus by visiting jhu.edu/classrooms.

Johns Hopkins Bookstore
Students can purchase supplies and JHU-themed merchandise at the Barnes & Noble Johns Hopkins Bookstore, located at 3300 St. Paul Street (at the corner of St. Paul and 33rd). For information and store hours, call 410.662.5850 or visit johns-hopkins.bncollege.com.

Johns Hopkins Student Union
The Student Union is located in Levering Hall and the Glass Pavilion and offers various programs and activities for students, faculty, staff, and friends of the university. Levering Hall also contains a complete dining facility that serves snacks and sandwiches during the late afternoon and early evening and hot meals during lunchtime.

Security Services
Visit jhu.edu/security for an in-depth review of security services available to student, faculty, and visitors to the Homewood campus. All are encouraged to report crimes or suspicious activity by calling 410.516.7777. For any other security-related matters call 410.516.4600. Students are encouraged to register with the JHU voluntary crisis alert system. This system sends text messages to students when emergency conditions exist. To sign up, students log on to my.johnshopkins.edu, enter their Emergency Alert cell phone number and select the appropriate Johns Hopkins Campus.

Parking
The Homewood Parking Office is located in the South Garage, on the south end of campus, under Mason Hall. Office hours are Monday through Friday, 7:30am–6pm and Saturday and Sunday 10am–6:00pm. Evening students and faculty have a number of options for on-campus parking. For further information and a parking map visit parking.jhu.edu or call 410.516.PARK.

Shuttle Service
The Blue Jay Shuttle provides students with transportation between Baltimore campuses as well as to various locations in Baltimore. More information and a schedule can be found at the parking website, parking.jhu.edu/bluejayshuttle.html.

Montgomery County Campus
The Johns Hopkins University Montgomery County Campus offers part-time graduate courses in several disciplines, including engineering, education, business and biotechnology. Students attend classes in the evening, enabling them to hold
full-time jobs during the day. Located minutes outside of Washington D.C., the Montgomery County Campus boasts an ideal setting for academics, and for research and corporate endeavors. The campus is close to I-270, the Shady Grove Metro Station on the Red Line and a Metro bus route. Gilchrist Hall and the Academic & Research Building include administrative offices, classrooms, computer labs, a wet lab and an auditorium. Services available include wireless access, a library and parking.

Library Services
The Montgomery Library Resource Center, a satellite of the Sheridan Libraries’ Milton S. Eisenhower Library, provides a wide range of services to students and faculty. Library staff members are available to provide individual reference assistance or group instructional sessions and to facilitate interlibrary loan, reserves and an array of library services. The library, located on the first floor of Gilchrist Hall, offers access to hundreds of online databases, electronic journals and an onsite collection of books supporting the programs offered at the Montgomery County Campus. In addition to the center collection, faculty and students have access to hundreds of full-text databases through workstations in the library, the open computer lab, and easy access from home and off-campus. Students and faculty can obtain journal articles, books and audio-visual material not available at the resource library. Articles can be delivered to the desktop, and material can be delivered to the center for pickup. To borrow materials, students must present their Johns Hopkins University J-Card at the circulation desk. To find out more about the library, including hours and contact information, visit guides.library.jhu.edu/dc/regional.

CIRLA (Chesapeake Information and Research Library Alliance)
CIRLA is a program allowing Johns Hopkins faculty and graduate students to go in person to a participating library in the region and borrow materials. A JCard must be presented to apply for CIRLA privileges. For participating libraries and instructions for borrowing, visit library.jhu.edu/services/circulation/otheraccess.html.

Computers
Web-enabled computer work stations are located throughout the MCC campus, providing access to email and other web resources. Kiosks are not enabled for printing. The MCC Open Computer Lab, located at Gilchrist 324, offers Internet access and the latest Microsoft Office software applications. Printing is available for a fee with a printing card, which can be purchased from the library on the first floor of Gilchrist Hall. The MCC Open Computer Lab is open from 8 a.m. to 10 p.m. Monday through Friday, and 8 a.m. to 6 p.m. on Saturday.

Food and Refreshments
The Food for Thought Café offers beverages, sandwiches, salads, snacks and more. It is located on the first floor of the Academic & Research building. Hours vary. Several restaurants are open along the parking garage facing Medical Center Drive, including Subway, Freshii, West Wing Café & Bakery, Blue Fin and Natural Market.

Security Services
The Montgomery County Campus has a security presence in all buildings and a security car used to patrol parking areas.
In case of an emergency, call 301.294.7000 or contact the front desk in the Academic and Research Building or front desk in Gilchrist Hall. Students are encouraged to register with the JHU voluntary crisis alert system. This system sends text messages to students when emergency conditions exist. To sign up, students log on to myjohnshopkins.edu, enter their Emergency Alert cell phone number and select the appropriate Johns Hopkins Campus.

Parking
Free parking is available in the lots on Broschart Road. All non-designated spaces are available for student and visitor use. All regular campus users must display a valid JHU Montgomery County Campus parking tag hanging from the rearview mirror of their vehicle(s). A parking tag may be obtained free of charge from the reception desk in Gilchrist Hall.

Washington, DC Center
The Johns Hopkins University Bernstein/Offit Building at 1717 Massachusetts Avenue, NW, is the administrative office for Advanced Academic Programs. Student Services, Admissions, Registration, and Career Services Center are located in Washington, just two blocks south of Dupont Circle, and accessible by Metro. The center includes a Library Resource Center, faculty and student lounges, an administrative and program management suite, as well as classrooms, executive education conference rooms, computer labs, wireless access, and a large presentation room. The Washington, DC Center provides an excellent learning environment for Advanced Academic Programs and many Arts and Sciences Washington-based initiatives. Guests, faculty, staff, and students must sign in at the security guard’s desk in the lobby or show university ID.

Library Services
Under the direction of the Sheridan Libraries, Advanced Academic Programs students in Washington are welcome to do research in the Washington Library Resource Center (WLRC). The center’s staff provide reference consultation and instruction, and facilitate access to a vast array of electronic databases, journals, the online catalog, reserve services, and a collection of materials supporting each of the programs offered by the schools.

Students and faculty can also obtain journal articles, books, and audio-visual material not available at the center library. Articles can be delivered to the desktop, and material can be delivered to the center for pickup. The JCard is used for identification and borrowing privileges. The Library Resource Center has 10 workstations in the Electronic Research Room. Additionally, students may access electronic resources from off-campus. The library is open year-round from noon to 8pm, Monday through Thursday; noon to 5pm, Friday; and 9:30am to 1:30pm on Saturday. To learn more, visit guides.library.jhu.edu/dc/regional.
CIRLA (Chesapeake Information and Research Library Alliance)
CIRLA is a program allowing Johns Hopkins faculty and graduate students to go in person to a participating library in the region and borrow materials. A JCard must be presented to apply for CIRLA privileges. For participating libraries and instructions for borrowing, visit library.jhu.edu/services/circulation/otheraccess.html.

Computers
AAP has two teaching labs and one open lab for AAP students located on the 4th floor of the Bernstein/Offit building. Internet access connects students to university-wide electronic services. Conventional and specialized software applications are installed to meet the needs of instruction and students. Hours vary each semester and are posted at the center. Wireless Internet access is available throughout the building.

DC Learning Commons
The Carey Business School, the Krieger School of Arts & Sciences, Advanced Academic Programs and the School of Advanced International Studies at Johns Hopkins University are pleased to announce the opening of the DC Learning Commons. Located in the Bernstein-Offit Building at 1717 Massachusetts Avenue NW, the DC Learning Commons is the first of many future initiatives to create a collaborative campus environment for Johns Hopkins students in Washington, DC. The Commons provides a vibrant environment for study, collaboration, interaction and the coming together of students of the three distinct, unique and distinguished schools within the University.

Conference rooms, group study rooms, open group study areas, printing services and a student kitchenette are provided. Student Service staff and faculty offices are co-located to provide opportunities for students and faculty to interact. The space is designed to accommodate the broad variety of learning styles including self-study, small group study, open group study and technology-enhanced study. We look forward to welcoming our students to the new space, and are excited about the opportunity for enhanced learning and networking that the Learning Commons gives our students.

Classrooms
Nearly all classrooms at the Washington, DC Center are equipped with enhanced audio-visual technology including a PC, projector, audio speaker system, remote control presenter, VCR, and DVD player. Faculty and students can deliver presentations using the classroom computer provided by Advanced Academic Programs, or may alternately connect their own laptop to the AV projection system.

Additional Area for Food and Refreshments
An additional student lounge is located on the lower level and has snacks and refreshment machines. The lounge has tables and chairs for those who stop by any of the nearby eating establishments and wish to bring food to the center. The Galley Café, located at 1625 Massachusetts Avenue, NW, in the Airline Pilots Building, provides light fare to 7:30pm Monday through Thursday and is closed on weekends.

Security Services
Washington, DC students are encouraged to register with the JHU voluntary crisis alert system. This system sends text messages to students when emergency conditions exist. To sign up, students log on to my.johnshopkins.edu, enter their Emergency Alert cell phone number and select the appropriate Johns Hopkins Campus.

At the Washington, DC Center, all students and faculty must show a JCard or other university ID at the lobby desk. Visitors are required to show a picture ID and sign in. There is a phone on the fourth floor that connects directly to the lobby security guard in case of an emergency.

Parking
Pricing at 1717 Massachusetts Ave. NW (underneath the Bernstein/Offit Building) is open Monday–Friday for student and JHU parking from 4-11pm at a rate of $7 and Saturday from 7am-6pm at a rate of $7. For more information call (202) 862-8515 (rates and hours are subject to change without prior notice).

There is a reduced-fee parking arrangement with Central Parking at 1800 Massachusetts Avenue NW. The garage is located in the lower level of the SEIU building on the corner of 18th and Massachusetts Avenue, with the entrance on 18th street. Students, faculty, and visitors may take advantage of the reduced fee 4:30 to 11pm Monday through Friday. Johns Hopkins University does not control the accessibility of this service.

Online Learning
AAP offers intensive, interactive, and rigorous academic online courses. Frequent meaningful participation is expected of all students, and the demands placed on online students are comparable to those in face-to-face courses. The bulk of course work is done on a student’s own schedule throughout the week, making these courses ideal for serious students who need flexibility in location and timing.

Learning Management System
All fully online courses and Web-supported course sites are provided via Blackboard, our Learning Management System (LMS). Students log in to Blackboard using their JHED (Johns Hopkins Enterprise Directory) login ID and password. This is the same ID and password used for course registration in ISIS, remote library access, etc. For information on JHED login, course site addresses, technical assistance, and many of the Hopkins digital resources, students can visit advanced.jhu.edu/students. Students registering for online courses should be sure to sign up for their Johns Hopkins University email account and use this account for all JHU business and academic matters.

Registration Requirements for Online Courses
Students taking their first online course with the Advanced Academic Programs must participate in an online Orientation Course prior to the start of the term. Please see Academic Regulations for Online Courses for each specific degree program.
Library Services
Advanced Academic Programs provides access to all JHU electronic library resources. Learn more at advanced.jhu.edu/students/libraries.

Online Course Technical Support
The Johns Hopkins University believes technology should be a student asset and never an obstacle to online learning. This is why, as an online learner at JHU, you can access our 24/7 Personal Support Center anytime. The Personal Support Center is always available to assist you with any technical issues that may arise within your online classroom or pertaining to your online learning. To reach the Personal Support Center, call: (855) 593-0086.

ADDITIONAL STUDENT SERVICES

Career Services
Current AAP students and alumni are encouraged to utilize Optimal Resume, a career management resource tool where you can search for job openings, create your own professional website to share with network contacts, and develop career materials for your job search. Students and alumni should use their JHU email and password to login here: advanced-jhu.optimalresume.com.

MBS Direct Bookstore
Advanced Academic Programs is serviced by a virtual bookstore, MBS Direct. MBS Direct provides textbook information for students taking courses at all AAP onsite locations and online. The online bookstore offers competitive pricing, new and used books, and buy backs from their large distribution center.

Visit the MBS Direct online store (http://bookstore.mbsdirect.net/jhu-aap.htm) to begin purchasing your textbooks. The bookstore opens 4 weeks before the start of the semester/term. If your book is not listed at that time, no textbook information has been entered by the instructor. If that is the case, keep checking back as information is updated daily before the semester start. Orders can also be placed by phone 800-325-3252 or fax 800-499-0143. Direct questions about your book order to the MBS customer service line at 800-325-3252.

Disabilities Services
The Johns Hopkins University is committed to providing reasonable and appropriate accommodations to students with disabilities. For persons with disabilities, it is important to provide a request for accommodation form along with a comprehensive evaluation of a specific disability from an appropriate qualified diagnostician that identifies the type of disability, describes the current level of functioning in an academic setting, and lists recommended accommodations. All documentation will be reviewed, and reasonable accommodations will be provided based on the student's needs. Depending on the accommodation, there may be a time delay before accommodations can be implemented. It is preferred, not required, for students to contact aapdisability@jhu.edu in the School of Arts and Sciences Advanced Academic Programs four weeks prior to the beginning of each semester or event to ensure that services will be available. An accommodation request form and further information can be found at http://advanced.jhu.edu/current-students/current-students-resources/disability-accommodations/. Regarding university wide disability concerns, contact 410.516.8949 or visit http://web.jhu.edu/disabilities.

Inclement Weather Announcements
When the university closes due to inclement weather, driving conditions, or other unforeseen circumstances, announcements are posted on the Emergency and Weather Hotline, at 410.516.7781 in Baltimore. For localities outside the Baltimore calling area, call 800.548.9004. The information is also made available on the Johns Hopkins University home page at jhu.edu.

Financial Aid
For information about federal financial aid in the form of student loans, students should contact the Office of Student Financial Services, 146 Garland Hall on the Homewood campus. Call 410.516.8028, email at aapfinaid@jhu.edu or visit the financial aid web page at http://pages.jh.edu/~finaid/part_time.html.

Alternative Loans
All students, including students taking only one course, may borrow an alternative loan to assist with educational expenses. More information is available at jhu.edu/finaid/grads_loans.html.

Financial Aid Programs
Contact the Office of Student Financial Services for information about:
> Federal Direct Student Loan
> Federal Perkins Loan
> Title IV Refunds

Veterans Benefits
Johns Hopkins University is approved by the Maryland Higher Education Commission for the training of veterans and the widows and children of deceased veterans under provisions of the various federal laws pertaining to veterans' educational benefits. General information and support is provided to veterans in multiple ways. Advanced Academic Programs offers a very limited number of Yellow Ribbon Awards for eligible veterans using Chapter 33 (Post 9/11) benefits. AAP students who are veterans may contact the AAP Registrar in Washington, DC with general inquiries: aapregistration@jhu.edu or 202.452.1952. For detailed information about veterans' benefits and enrollment procedures contact: Veterans Desk, Office of the Registrar, 75 Garland Hall, The Johns Hopkins University, 3400 N. Charles Street, Baltimore, Maryland 21218-2934, 410.516.7071, web.jhu.edu/registrar/veterans.

Satisfactory Academic Progress
Students who receive Federal Student Financial Aid must, in
accordance with federal, state, and institutional requirements, must meet Satisfactory Academic Progress (SAP) established specifically for financial aid purposes. SAP measures three components: 1. cumulative grade point average (or equivalent measure), 2. cumulative completion rate of courses attempted, 3. complete a degree or certificate within the University’s published maximum time frame. Because these measures are cumulative, all periods of enrollment (even periods when a student did not receive financial aid) must be included in the determination of SAP. The requirements needed for financial aid are different from what may be required by your academic program to remain in “good standing” — students who receive financial aid should take particular care to ensure compliance with SAP as well as AAP academic policies.

Under Federal Title IV law, the college’s Financial Aid SAP requirements must meet certain minimum requirements, and be at least as strict and the college’s standards for Good Academic Standing. SAP is reviewed at the end of each traditional semester of enrollment. The policy applies to students applying for financial aid for semesters/period of enrollment that begin with the fall 2013 semester.

For details regarding the Financial Aid SAP policy, please visit: jhu.edu/finaid/part_time.html#sap.

POLICY STATEMENTS

Students enrolled in course offerings provided by the Advanced Academic Programs are responsible for adhering to the policies set forth and established by Johns Hopkins University. Students should visit myJHU.edu to explore a more comprehensive list of university policies. Although every university policy is not listed in the catalog, AAP students are responsible for adhering to all policies set forth by JHU.

Policy on Student or Alumni Letters of Reference

No member of the faculty is obliged to provide a student or graduate with an evaluation or letter of recommendation which does not accurately reflect that faculty member’s true opinion and evaluation of that student’s or former student’s academic performance and conduct.

Notice of Nondiscriminatory Policy

The Johns Hopkins University admits students of any race, color, gender, religion, age, national or ethnic origin, disability, marital status or veteran status to all of the rights, privileges, programs, benefits, and activities generally accorded or made available to students at the university. It does not discriminate on the basis of race, color, gender, marital status, pregnancy, ethnicity, national origin, age, disability, religion, sexual orientation, gender identity or expression, veteran status, or other legally protected characteristic in any student program or activity administered by the university, including the administration of its educational policies, admission policies, scholarship and loan programs, and athletic and other university-administered programs or in employment.

Questions regarding Title VI, Title IX, and Section 504 should be referred to the Office of Institutional Equity, 130 Garland Hall, Telephone: 410.516.8075, TTY 410.516.6225.

Policy on Possession of Firearms on University Premises

The possession, wearing, carrying, transporting, or use of a firearm or pellet weapon is strictly forbidden on university premises. This prohibition also extends to any person who may have acquired a government-issued permit or license. Violation of this regulation will result in disciplinary action and sanctions up to and including expulsion, in the case of students, or termination of employment, in the case of faculty and staff. Disciplinary action for violations of this regulation will be the responsibility of the divisional student affairs officer, dean or director, or the vice president for human resources, as may be appropriate in accordance with applicable procedures. Any questions regarding this policy, including the granting of exceptions for law enforcement officers and for persons acting under the supervision of authorized university personnel, should be addressed to the appropriate chief campus security officer.

Advanced Academic Programs will consider exceptions to this policy only for law enforcement personnel who are required by law or their agency’s regulations to carry a weapon while on a campus or center. Requests for an exception must be addressed to Dr. Kathleen Burke, Associate Dean (kmburke@jhu.edu) in advance of coming to a campus or center. Law enforcement personnel will be required to submit a letter from an authorized official on agency letterhead; the letter must satisfactorily address the justification and need for an exception to the JHU policy.

Statement Regarding the Privacy Rights of Students

The Johns Hopkins University complies with the provisions of the Family Educational Rights to Privacy Act of 1974 (P.L. 93-380) as amended (P.L. 93-568) and any regulations which may be promulgated there under. Students and others who desire specific information regarding their rights of access to institutional educational records maintained in their names are advised to contact the Registrar’s Office, 75 Garland Hall, Homewood campus, for a copy of the university’s policy.

Americans with Disabilities Act Policy (ADA)

The Johns Hopkins University does not discriminate on the basis of gender, marital status, pregnancy, race, color, ethnicity, national origin, age, disability, religion, sexual orientation, veteran status or other legally protected characteristics in any student program or activity administered by the university or with regard to admission or employment.

A person with a disability is defined by the Rehabilitation Act of 1973 and by the Americans with Disabilities Act of 1990 as an individual who has a physical or mental impairment that substantially limits one or more major life activities, has a record of such an impairment, or is regarded as having such an impairment. For faculty, staff, and students with disabilities, it is important to provide to the university a comprehensive
evaluation of a specific disability from an appropriate qualified
diagnostician that identifies the disability, describes the current
level of functioning in an academic or employment setting, and
lists recommended accommodations. The university provides
appropriate, necessary, and reasonable accommodations in
programs and facilities for those individuals who are qualified.

This policy is available at jhu.edu/oie/disability. Questions
regarding compliance with the provisions of the American with
Disabilities Act of 1990 and Section 504 of the Rehabilitation Act
of 1973 should be referred to the Office of Institutional Equity,
130 Garland Hall, Homewood campus, 410.516.8949 or (TTY)
410.516.6235.

Sexual Violence, Sexual Assault, Relationship
Violence and Stalking Policy

Purpose of this Policy
The Johns Hopkins University is committed to providing a
safe educational and working environment for its students,
trainees, faculty, staff and other members of the University
community. The University prohibits sexual violence and sexual
assault, (which along with sexual harassment, prohibited by
the University’s Policy Against Sexual Harassment, are forms
of “sexual misconduct”), domestic violence and dating violence
(collectively, “relationship violence”), and stalking. This conduct
is disruptive of the learning and working environment of the
University’s community members and will not be tolerated
by the University. The University is committed to preventing
sexual misconduct, relationship violence, and stalking, as well
as addressing its effects on the University community. The
University has adopted this Policy in order to inform students,
trainees, faculty, and staff and other members of the University
community of their rights and responsibilities in the event they
are or have knowledge of someone involved in an incident of
sexual misconduct, relationship violence or stalking and of the
services available to victims of sexual misconduct, relationship
violence and stalking.

Scope of this Policy
This Policy applies to all members of the University community,
including, but not limited to students, trainees, faculty and staff,
and it covers prohibited conduct that occurs on campus or other
University property; occurs in connection with JHU programs or
activities, including academic, educational, extracurricular,
athletic or other programs and activities; or otherwise affects
the University community. In certain instances, this Policy
applies to third parties (e.g., visitors, volunteers, vendors, and
contractors while on University property, participating in a
University sponsored activity, or providing services to the
University, applicants for admission or employment with the
University, and former affiliates of the University). This Policy
applies equally to all regardless of an individual’s sex, gender,
sexual orientation, gender identity or gender expression. All
academic and administrative units of the University (including
all schools, divisions, campuses, departments and centers) must
comply with, and ensure that their policies and procedures
comply with, this Policy.

For more information, please refer to http://web.jhu.edu/
administration/jhuie/equity_compliance/procedures.html.

Procedures on Discrimination, Harassment,
Sexual Misconduct, Relationship Violence and
Stalking

Purpose and Scope of Procedures
The Johns Hopkins University is committed to providing
the members of its community with an environment free
from discrimination and harassment, including sexual
harassment, sexual violence and sexual assault (collectively,
“sexual misconduct”); domestic violence and dating violence
(collectively, “relationship violence”); and stalking. The
University will not tolerate discrimination, harassment, sexual
misconduct, relationship violence and stalking. The University
is prepared to receive, investigate and resolve complaints of
discrimination, harassment, sexual misconduct, relationship
violence and stalking that are brought by members of the
University community to the attention of a responsible
employee, as identified in these Procedures.

Members of the University community, including students,
trainees, faculty and staff, and certain third parties (e.g., visitors,
volunteers, vendors, and contractors while on University
property, participating in a University sponsored activity, or
providing services to the University, or applicants for admission
to or employment with the University, or former affiliates
of the University) may bring complaints of violations of the
University’s Anti-Harassment Policy, Policy Against Sexual
Harassment and Sexual Violence, Sexual Assault, Relationship
Violence and Stalking Policy under these Procedures.

All academic and administrative units of the University,
including all divisions, schools, campuses, departments and
centers, must comply with, and ensure that their policies and
procedures comply with, these Procedures. To the extent there
is any inconsistency between written unit procedures and these
Procedures, these Procedures control.

For more information, please refer to http://web.jhu.edu/
admnistration/jhuie/equity_compliance/procedures.html.

Sexual Harassment Prevention and
Resolution Policy

Preamble
The Johns Hopkins University is committed to providing its
staff, faculty, and students the opportunity to pursue excellence
in their academic and professional endeavors. This can only
exist when each member of our community is assured an
atmosphere of mutual respect, one in which they are judged
solely on criteria related to academic or job performance. The
university is committed to providing such an environment, free
from all forms of harassment and discrimination. Each member
of the community is responsible for fostering mutual respect,
for being familiar with this policy, and for refraining from
conduct that violates this policy.

Sexual harassment, whether between people of different sexes
or the same sex, is defined to include but is not limited to
1. Submission to such conduct is made implicitly or explicitly a term or condition of an individual's employment or participation in an educational program;

2. Submission to or rejection of such conduct by an individual is used as the basis for personnel decisions or for academic evaluation or advancement;

3. Such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creates an intimidating, hostile, or offensive working or educational environment.

Fundamental to the university's purpose is the free and open exchange of ideas. It is not, therefore, the university's purpose, in promulgating this policy to inhibit free speech or the free communication of ideas by members of the academic community.

Policy
The University will not tolerate sexual harassment, a form of discrimination, a violation of federal and state law and a serious violation of university policy. In accordance with its educational mission, the university works to educate its community regarding sexual harassment.

The University encourages reporting of all perceived incidents of sexual harassment, regardless of who the alleged offender may be. Individuals who either believe they have become the victim of sexual harassment or have witnessed sexual harassment should discuss their concerns with the university's equity compliance director. Complainants are assured that problems of this nature will be treated in a confidential manner, subject to the University's legal obligation to respond appropriately to any and all allegations of sexual harassment.

The University prohibits acts of reprisal against anyone involved in lodging a complaint of sexual harassment. Conversely, the university considers filing intentionally false reports of sexual harassment a violation of this policy. The University will promptly respond to all complaints of sexual harassment. When necessary, the university will institute disciplinary proceedings against the offending individual, which may result in a range of sanctions, up to and including termination of university affiliation. Complaints of sexual harassment may be brought to Caroline Laguerre-Brown, Vice Provost for Institutional Equity for the university, Allison J. Boyle, Title IX Coordinator and Director for Equity Compliance & Education, Wyman 515, Telephone: 410.516.8075, TTY: Dial 711.

University Alcohol and Drug Policy
In keeping with its basic mission, the university recognizes that its primary response to issues of alcohol and drug abuse must be through educational programs, as well as through intervention and treatment efforts. To that end, the university provides appropriate programs and efforts throughout the year. The brochure "Maintaining a Drug-Free Environment: The Hopkins Commitment" is distributed annually to all faculty, students, and staff of Johns Hopkins, and copies are available on request from the offices of the Faculty and Staff Assistance Program, 1101 East 33rd Street, Suite C-100, Baltimore, Maryland 21218; telephone 410.516.8278; or at the Counseling and Student Development Center located in 3003 N. Charles Street, Suite S-200, Baltimore, MD 21218 (near 30th Street in Homewood Apartments); telephone 410.516.8278.

Photography and Film Rights Policy
The Johns Hopkins University reserves the right from time to time to film or take photographs of faculty, staff, and students engaged in teaching, research, clinical practices, and other activities, as well as casual and portrait photography or film. These photographs and films will be used in such publications as catalogs, posters, advertisements, recruitment, and development materials as well as on the university's website, for various videos, or for distribution to local, state, or national media for promotional purposes. Classes will be photographed only with the permission of the faculty member. Such photographs and film—including digital media—which will be kept in the files and archives of The Johns Hopkins University, will remain available for use by the university without time limitations or restrictions. Faculty, students, and staff are made aware by virtue of this policy that the university reserves the right to alter photography and film for creative purposes. Faculty, students, and staff who do not want their photographs used in the manner(s) described in this policy statement should contact the Office of Communications and Public Affairs. Faculty and students are advised that persons in public places are deemed by law to have no expectation of privacy and are subject to being photographed by third parties. The Johns Hopkins University has no control over the use of photographs or film taken by third parties, including without limitation the news media covering university activities.

Principles for Ensuring Equity, Civility and Respect for All
The Johns Hopkins University is a leader in research, patient care and education. Our vision is to continue that leadership by ensuring a university culture that is without illegal discrimination and embraces both equity and diversity. We value all members of our community and their contributions to our mission. We demonstrate that value by ensuring that:

> The Johns Hopkins University is an environment in which all people behave in a manner that engenders mutual respect, treating each other with courtesy and civility regardless of position or status in the academy. Rude, disrespectful behavior is unwelcome and will not be tolerated.

> Our community is one where we demonstrate respect for each other; we accept our individual differences; and we provide opportunities for everyone to maximize his or her potential. Every member of our community will be held accountable for creating a welcoming workplace for all.

> Paths to leadership are clear so that opportunities are not blocked artificially. Leadership positions are filled from inclusive candidate pools established by casting wide nets in non-traditional ways. We will not tolerate exclusion based on gender, marital status, pregnancy, race, color,
> ethnicity, national origin, age, disability, religion, sexual orientation, gender identity or expression.

> Salary equity is reviewed on a regular basis. We compensate our employees for the job they do in a manner that is equitable and rewards excellence in performance. We will not pay lower salaries to women and people of color simply because they are women and people of color.

> We support work/life balance by encouraging flexibility in the workplace; establishing supportive human resource policies and practices; and providing employee benefits that encourage healthy work- and lifestyles. We will not sacrifice the health of our employees and their families in the pursuit of excellence.

> We hold our community and its individual members accountable for accomplishing these goals.
Economic analysis is no longer relegated to academicians and a small number of PhD-trained specialists. Instead, economics has become an increasingly ubiquitous, as well as rapidly changing, line of inquiry that requires people who are skilled in analyzing and interpreting economic data, and then using it to effect decisions about national and global markets and policy involving everything from health care to foreign aid to the environment.

Advances in computing and the greater availability of timely data through the Internet have created an arena that demands skilled statistical analysis, complemented by economic modeling and reasoning. These skills are in very high demand by government agencies, congressional committees, international lending institutions, trade associations, private businesses (including those in the financial services sector), and private consulting firms.

The Master of Science in Applied Economics develops skills in economic reasoning and in constructing and estimating economic models through the use of econometrics and other quantitative techniques. This is accomplished by a rigorous and demanding curriculum and a talented and dedicated staff of instructors. The foundation for intelligent economic reasoning is laid with courses in Microeconomic and Macroeconomic Theory; Statistics and Econometrics create the foundation for empirical analysis. These skills are deepened by taking an advanced econometrics course. A diverse array of electives provides detailed knowledge of specific areas of economics and additional experience in economic modeling and econometric estimation. Our objective is to graduate students who have learned the skills needed to develop and estimate models with which to address the questions they face in their professional activities.

ILLUSTRATIVE CURRICULA

All curricula are available onsite; a few are also available online. Students choose their electives freely. The program’s courses in Quantitative Methods can be plugged into the curricula that students build. The following merely illustrates the great substantive flexibility of the program:

**Public Policy**

For contributing to any level of government policy formulation and policy making. Choose from among a rich variety of electives: Economics of Industry and Public Policy; two courses in Public Economics, Economics of Health Care, Environmental and Resource Economics, Economics of the Labor Market, Law and Economics, and Political Economy. Cost-Benefit Analysis provides conceptual and quantitative tools essential for contemporary microeconomic policy formulation and evaluation. Both Microeconometrics and Macroeconometrics are germane to the subject, as is Survey Research Methods. Computable General Equilibrium Modeling builds a powerful tool with widespread use in the analysis of taxation, income distribution, and environmental matters.

**Macroeconomics/ Financial Economics**

These are two strongly complementary subjects, and we have a rich set of offerings: Monetary Economics, International Finance (Open Economy Macro), and Economic Growth treat the economic aggregates, while Topics in Macroeconomics additionally provide perspective. Financial Economics lays the foundation for the intertemporal and interstatial (risk) microeconomic analysis, and Financial Intermediation & Financial Markets considers how existing institutions cope with both. Depth and perspective are gained through Economics of Derivative Securities and Behavioral Economics and Finance. Quantitative tools are found in Macroeconometrics, Financial Econometrics, and Macroeconomic Forecasting. Economics of the Labor Market complements Macroeconomics.

**International Economics and Development**

For gaining an analytical and quantitative perspective on global matters. Substantive courses include International Finance, International Trade, Development Microeconomics, and Economic Growth. Here too, Cost-Benefit Analysis provides essential conceptual and quantitative tools. Microeconometrics and/or Macroeconometrics, as well as Survey Research Methods further develop the corresponding quantitative skills. Computable General Equilibrium Modeling builds a powerful tool with widespread applicability in this field. A student can round out the subject in-house.

**Spatial Economics**

For contributing to local economic policy analysis and policy making. Students choose Regional Economics and Urban Economics from the Applied Economics Program, and
Geographic Information Systems (GIS) and Spatial Analysis from the GIS Program. The MS Degree can be earned fully online by students pursuing this subject.

Environmental Economics
For contributing to efficient policy. Students take Environmental and Resource Economics, Cost-Benefit Analysis, and Microeconometrics and/or Macroeconometrics in the Applied Economics Program. Computable General Equilibrium Modeling builds a powerful tool with widespread use in the field. Up to two courses from the in-house Environmental Science and Policy, Energy and Climate Change, or Geographic Information Systems programs, some of which are available online, can count towards the electives in our program, as can courses from the Johns Hopkins Engineering for Professionals, Environmental Planning and Management Program, most of which are available online. The MS Degree can be earned fully online by students pursuing this subject.

Health Economics
Brings to bear the tools of economics in this burgeoning field. Students take Economics of Health Care, Cost-Benefit Analysis, and Microeconometrics in the Applied Economics Program, and choose four or eight credits (equivalent of up to two of our courses) from science, specialized quantitative, and policy courses in the part-time Master of Public Health Program at the Bloomberg School, offered online. The MS Degree can be earned fully online by students pursuing this subject.

Economics of National Security
For contributing to efficient allocation of resources in a vital sector. Students take Economics of National Security, Cost-Benefit Analysis, and Microeconometrics in the Applied Economics Program. They should consider Game Theory and Economics of the Labor Market, and can choose up to two of their electives from the AAP National or Global Security Studies Programs, Strategic Studies concentration, in-house.

ADMISSION REQUIREMENTS
In addition to the materials and credentials required for all programs, the Master of Science in Applied Economics also requires:

- A grade point average of at least 3.0 on a 4.0 scale in undergraduate and prior graduate studies
- One semester of introductory microeconomics, passed with at least a B
- One semester of introductory macroeconomics, passed with at least a B
- One semester of undergraduate calculus or equivalent, passed with at least a B

Application Documents
- AAP application and fee
- An official undergraduate transcript, and all graduate transcripts, if any
- One page résumé and a statement of purpose not exceeding 250 words
- Two letters of recommendation from colleagues, previous instructors, supervisors, or others

F-1 Visa Restrictions
International students on an F-1 visa must take at least three courses in fall and spring semesters to maintain visa status. Such students must take Math Methods for Economists and/or Statistics online before entering the United States, unless waived and can then commence their studies on-site in any semester.

COURSE REQUIREMENTS
- Four Core courses (see course descriptions on the following pages)
- Either 440.618 Microeconometrics OR 440.614 Macroeconometrics (course descriptions)
- Five other elective courses (course descriptions)

Courses are offered on-site in Washington, DC. Many courses are additionally available online. For information on exact dates, times, fees, and instructors for any term, students should consult the Course Schedule available several months prior to the beginning of each term (see advanced.jhu.edu). Courses are open only to students who meet enrollment requirements and satisfy the prerequisites.

DUAL MS IN APPLIED ECONOMICS/MBA
To allow students to better exploit the strong complementary nature between business and economics, the Carey Business School of Johns Hopkins University and the Applied Economics Program have eliminated the overlap between the MS in Applied Economics and the MBA. This enables students to earn both the MS degree and the MBA in fewer courses than if pursued separately. Those interested, including current students of either school, should apply to the dual MS in Applied Economics/MBA through Advanced Academic Programs. Course requirements, which can be pursued simultaneously at both schools, are:

MS in Applied Economic Requirements

- Prerequisite Math Requirement
  Those entering with only a single Calculus course must first take 440.304 Math Methods for Economists, a non-credit, full-length course, at half tuition, as the first of 8 program courses. Those entering with two Calculus courses may study the extra material on their own.

- Four core courses:
  440.601 Microeconomic Theory
  440.602 Macroeconomic Theory
440.605  Statistics  
440.606  Econometrics  
> One advanced econometrics course:  
440.614  Macroeconometrics or  
440.618  Microeconometrics  
> Three elective courses.  

MBA Requirements — Carey Business School  
Courses offered in Washington, DC; Columbia, MD; Baltimore, MD; and Montgomery County, MD. All courses are 2 credits.  
> Required Courses:  
120.601  Business Communication  
121.610  Negotiation  
131.601  Leadership Ethics Seminar  
132.601  Business Law  
142.620  Leadership in Organizations  
142.730  Strategic Human Capital  
210.620  Accounting and Financial Reporting  
231.620  Corporate Finance  
232.701  Investments  
310.620  Information Systems  
410.620  Marketing Management  
520.601  Decision Models  
680.620  Operations Management  
> Elective Courses:  
Eight 2-credit courses: (students may elect a concentration in Finance, Marketing, Management, or Real Estate).  

MS IN APPLIED ECONOMICS/GRADUATE CERTIFICATES IN ENVIRONMENTAL PLANNING AND MANAGEMENT  
To considerably ease the study of environmental matters together with economics, the Applied Economics Program of JHU Advanced Academic Programs and the Environmental Engineering, Science and Management Program of JHU Engineering for Professionals are mutually recognizing one of each other’s courses for credit. A student can earn the MS in Applied Economics and the Graduate Certificate in Environmental Planning and Management for a total of 14 courses, nine in Applied Economics, and five in Environmental Planning and Management, instead of the separately required 16. The Graduate Certificate courses are available online; the MS degree is available evenings near Dupont Circle in Washington, DC.  

Students applying to the dual degree program should download the application and submit supporting documents and application fee to the Advanced Academic Programs. The admissions department will forward the application to JHU Engineering for Professionals. Each program decides on admissions separately.  

The courses necessary to earn the two diplomas are shown below:  

<table>
<thead>
<tr>
<th>Applied Economics</th>
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<tbody>
<tr>
<td><strong>Course 1</strong></td>
<td>440.601 Microeconomic Theory</td>
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<tr>
<td><strong>Course 2</strong></td>
<td>440.602 Macroeconomic Theory</td>
</tr>
<tr>
<td><strong>Course 3</strong></td>
<td>440.605 Statistics</td>
</tr>
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MS IN APPLIED ECONOMICS/GRADUATE CERTIFICATE IN NATIONAL SECURITY STUDIES

Economics has long contributed to the analysis of national and global security matters. Prof. Arthur Pigou’s Political Economy of War, Macmillan, 1921, new ed. 1941, is probably the first full-length work that addressed this subject. While subsequent analysis has never ceased, it is currently difficult for students interested in these applications and the associated careers to find a formal, structured educational program to systematically train them in the two fields together.

To make it more convenient for students to study the two subjects together, the MS in Applied Economics and the Certificate in National Security Studies are recognizing one of each other’s courses. The total number of courses required to obtain the two diplomas is thereby reduced from 15 to 13, nine in Applied Economics and four in National Security Studies. Each program maintains its own admissions requirements, but allows students to simultaneously apply to, and study in, the other field. Students initially apply to either of the two programs, mentioning their intent to pursue the combined diplomas in a statement of purpose, and requesting their applications to be forwarded to the other program. Adhering to this process will avoid the paying of two application fees.

This combined diploma is probably singular in its content and its convenient, compact form. The course components are shown in the table below.

| Course 4  | 440.606 Econometrics |
| Course 5  | 440.618 Microeconometrics or 440.614 Macroeconometrics |
| Course 6  | 440.622 Cost Benefit Analysis |
| Course 7  | 440.650 Environmental & Resource Economics |
| Course 8  | 440.6XX Elective |
| Course 9  | 440.6XX Elective |

**Environmental Planning and Management**

| Courses 10-14 |
| Selection of five 575.xxx courses with adviser approval. |
| > Credit is given for 440.601 Microeconomic Theory, in lieu of 570.493 Economic Foundations for Public Decision Making |
| > Science courses from outside the subfield allowed with adviser approval. |

**Sample Courses**

| > Ecology |
| > Principles of Toxicology, Risk Assessment and Management |
| > Climate Change and Global Environmental Sustainability |
| > Air Resources Modeling and Management |
| > Water Resource Planning |
| > Environmental Law |
| > Environmental Impact Assessment |
| > Environmental Project Management |

**Applied Economics**

Course 1 440.601 Microeconomic Theory
Course 2 440.602 Macroeconomic Theory
Course 3 440.605 Statistics
Course 4 440.606 Econometrics
Course 5 440.618 Microeconometrics or 440.614 Macroeconometrics
Course 6 440.622 Cost-Benefit Analysis
Course 7 440.6XX Elective
Course 8 440.6XX Elective

**National Security Studies**

Course 10 470.606 American National Security
Course 11 A course from the list of approved science courses.
Courses 12-13 Two courses from the list of approved electives. For specific courses visit, advanced.jhu.edu/academic/national-security/requirements

INTERNATIONAL INSTITUTE OF FORECASTERS CERTIFICATE IN FORECASTING PRACTICE

The International Institute of Forecasters (IIF/forecasters.org) has approved two sequences of four of our courses as meeting their requirements for awarding their Certificate in Forecasting Practice: Students who have completed Statistics, Econometrics, Microeconometrics or Macroeconometrics, and Macroeconomic Forecasting with at least a B, and who have participated in an additional mini-course on “Forecasting in Organizations,” will be eligible for the Certificate in Forecasting Practice. The student fee to the IIF is $200. Those already holding MS Degrees in Economics from other institutions can typically have Statistics and Econometrics waived. Non-degree seekers are welcome to apply for the IIF Certificate as Special Students.

POST MASTER’S CERTIFICATE IN QUANTITATIVE METHODS IN APPLIED ECONOMICS

The four course Post-Master’s Certificate in Quantitative Methods in Applied Economics is intended for those who already hold a master’s degree in economics or in allied fields, and who wish to expand or update their knowledge. All courses are offered onsite in the evenings at the Washington, DC Center
of The Johns Hopkins University (near Dupont Circle), and already for the greatest part, on-line.

Admissions requirements are the same requirements for our MS in Applied Economics degree plus a master's degree in economics or allied field. Students lacking prerequisite courses can take them with us, on-site or on-line. Admissions are rolling; one can begin in the Summer, Fall, or Spring semester.

Choose four of the following eight courses:

- 440.614 Macroeconometrics [Time Series Econometrics]
- 440.615 Macroeconomic Forecasting
- 440.617 Financial Econometrics
- 440.618 Microeconometrics [Panel Data Econometrics]
- 440.619 Real Risk
- 440.622 Cost-Benefit Analysis
- 440.624 Computable General Equilibrium Modeling
- 440.629 Survey Research Methods

### Course Descriptions

#### Prerequisite Course

**440.304 Math Methods for Economists**
This is a non-credit full-length course at half tuition, required of those students who have had only a single course in Calculus. It covers those parts of Integral Calculus, Multivariable Calculus, Optimization Theory, and Linear Algebra, which are necessary to pursue economics. Prerequisite: A course in Calculus.

#### Core Courses

**440.601 Microeconomic Theory**
Prerequisite: 440.304 Math Methods for Economists. This course offers a systematic presentation of consumer theory, theory of the firm, and market equilibrium. Topics covered include constrained optimization, preferences and utility, exchange, production, pricing, market structures, and welfare economics.

**440.602 Macroeconomic Theory**
Prerequisite: 440.304 Math Methods for Economists. This course provides a systematic overview of the theory of aggregate output and employment, the rate of interest, and price level determination. Coverage includes the theories of consumption and investment, the demand and supply of money, inflation, unemployment, and economic growth. These topics are discussed in the context of contemporary empirical work on aggregative relationships.

**440.605 Statistics**
This course provides a general survey of statistical methodology. Topics include probability and sampling, distribution theory, hypothesis testing, estimation (Maximum Likelihood and Method of Moments), and Analysis of Variance. It is also designed to provide the requisite background for 440.606 Econometrics. Prerequisite: a course in Calculus

**440.606 Econometrics**
This course focuses on the application of statistical methods to the testing and estimation of economic relationships. After developing the theoretical constructs of classical least squares, common problems encountered when applying this approach, including serial correlation, heteroscedasticity, and multicollinearity, are discussed. Techniques for dealing with these problems are then examined. Models with lagged variables are considered, as is estimation with instrumental variables and two-stage least squares. Prerequisites: 440.605 Statistics.

#### Workshops

**440.011 Forecasting in Organizations**
This course is required to earn the International Institute of Forecasters Certificate in Forecasting Practice. This is a non-credit mini-course, equivalent to a single class meeting, but with more homework. It is offered during the January Intersession and May Intensive periods. Prerequisites: 440.615 Macroeconomic Forecasting, and 440.614 Macroeconometrics or 440.618 Microeconometrics.

**440.021 Practicum in Applied Economics**
Internships or external projects applicable to the program curriculum qualify for the course. Permission of the student’s advisor and of the Program Director is required before adding this course.

#### Electives – Quantitative Methods

**440.614 Macroeconometrics**
This course focuses on the practical uses of time-series econometrics in a macroeconomic context. The topics covered include autoregressive-moving average processes, non-stationary time series models, unit root tests, vector autoregression models, and cointegration analysis. Prerequisites: 440.602 Macroeconomic Theory; 440.606 Econometrics.

**440.615 Macroeconomic Forecasting**
This course examines econometric approaches to forecasting macroeconomic activity. The approaches covered span single equation time series to large, complex, simultaneous equations systems. Different measures to assess the forecasting accuracy of these approaches are addressed. A discussion of these approaches and their relevance for policy recommendations is also covered. Prerequisites: 440.602 Macroeconomic Theory; 440.606 Econometrics.

**440.617 Financial Econometrics**
(formerly 440.647) This course introduces students to the methods most commonly used in empirical finance. Key models and methods are ARCH, GMM, Regime-Switching Models, test of CAPM (Capital Asset Pricing Model), term structure models, and volatility models (implied, stochastic volatility). Students will also learn aspects of time series econometrics for both stationary and non-stationary variables at different time frequencies, with emphasis on financial variables. Prerequisites: 440.601 Microeconomic Theory; 440.606 Econometrics; 440.640 Financial Economics, or equivalent; 440.614 Macroeconometrics is recommended.
440.618 Microeconometrics
(formerly 440.648) This course covers a number of advanced techniques frequently encountered in applied microeconometric analysis. Topics include generalized method of moments estimation, nonlinear regression, estimation with panel data, systems of regression equations and simultaneous equation models, maximum likelihood estimation and likelihood ratio tests, and limited dependent variable analysis (i.e. Logit, Probit, Tobit, etc.). Prerequisites: 440.601 Microeconomic Theory; 440.606 Econometrics.

440.619 - Real Risk
This course presents an alternative view of risk that emphasizes the probabilistic nature of external events that affect economic actors. Students will learn the theory and practice of probabilistic risk analysis to solve four classes of problems: portfolio allocation [as an introduction], early warning, risk index construction, and real options. We will leverage some familiar and some new analytic tools, including decision trees, Bayesian networks, fault trees, Markov processes, convex optimization, and Monte Carlo simulation. Prerequisites: 440.601 Microeconomic Theory and 440.605 Statistics. Corequisite: 440.606 Econometrics. 440.640 Financial Economics is recommended but not required.

440.622 Cost-Benefit Analysis
(formerly 440.643) The objective of this course is to develop and apply an analytical framework for evaluating projects with an emphasis on publicly funded projects. Coverage includes the evaluation of benefits and costs over time, including in the presence of uncertainty, in the absence of market prices, and when income distribution objectives need to be incorporated into a project’s evaluation. Prerequisites: 440.601 Microeconomic Theory; Corequisite:440.606 Econometrics.

440.624 Computable General Equilibrium Modeling
This course will provide an understanding of how to independently develop, modify, run and interpret Computable General Equilibrium (CGE) models. CGE models are widely used in the analysis of International Trade, Taxation, Environmental Policy, and other subjects. The specific objectives of this course are as follows: Students will (1) gain an understanding of the underlying economic theory behind CGE modeling; (2) learn how to gather data sources from publicly available information to build CGE models; (3) gain an understanding of the software General Algebraic Modeling Software (GAMS) to run the models; (4) learn how use and modify existing CGE programs for research purposes; (5) be able to write simple CGE programs in GAMS; (6) be able to analyze public policy with CGE models; (7) how to interpret results from CGE models; (8) understand possible extensions of CGE models for potential future research purposes. Analytical skills developed through this class will assist you in building your careers as researchers, public managers, and policy analysts. Prerequisites: 440.601 Microeconomic Theory, 440.602 Macroeconomics Theory; Corequisite:440.606 Econometrics.

440.629 Survey Research Methods
(formerly 440.649) This course introduces students to the theory and practice of conducting surveys. Survey methods combines both social science — economics, sociology, and psychology — and quantitative methods — mathematics, statistics, and computer science — to develop a theory of how surveys can best be used to measure important aspects of the human condition. Key topics include sample design, weighting, data collection modes, administrative operations, questionnaire design, non-response, and estimation in surveys. Prerequisites: 440.605 Statistics; 440.606 Econometrics.

Electives – Applied Macroeconomics

440.630 Monetary Economics
(formerly 440.610) Among the topics covered in this course are money demand and money supply, inflation and the optimal quantity of money, the monetary policy transmission mechanism, the term structure of interest rates, strategies of monetary policy and optimal monetary policy, the time inconsistency problem in monetary policy, and monetary policy targets and rules. For each topic covered, the theory, policy relevance, and empirical evidence are presented and discussed. Prerequisites: 440.602 Macroeconomic Theory; 440.606 Econometrics.

440.631 Finance and the Macroeconomy
(formerly 440.621) This course explores the role of the financial sector in the overall macroeconomy. It begins by reviewing various financial instruments and markets, with a focus on their economic function. The course then examines the challenges to monetary and fiscal policy that arise because of macro-financial linkages. Further, a number of analytical tools for assessing financial stability and vulnerabilities to macro shocks are presented. Several case studies are used to illustrate real-world situations facing policymakers. Prerequisites: 440.601 Microeconomic Theory; 440.602 Macroeconomic Theory; 440.606 Econometrics; 440.640 Financial Economics, or equivalent.

440.632 Topics in Macroeconomics
This course aims to develop a better understanding of the linkages between the banking system and the broader macroeconomy. Particular attention will be paid to the role of banks and the banking system in propagating and perpetuating the recent financial crisis. Specific topics include: The functioning of the banking system in a basic general equilibrium macro model; the Diamond-Dybvig model of bank runs; an empirical look into the economic cost of banking crises; central bank intervention in the face of a banking failure; the link between sovereign debt and the banking system; the European debt crisis and the response of the ECB. Prerequisites: 440.601 Microeconomic Theory; 440.602 Macroeconomic Theory; and 440.606 Econometrics.

440.634 Economic Growth
Examines contemporary theories of economic growth and empirically applies them to panels of present day developing and industrialized countries, and to the historical evolution of individual countries and groups of countries. Topics include neoclassical growth models, population and growth, the economics of ideas, endogenous growth models, aid and growth, and policy and growth. Prerequisites: 440.601 Microeconomic
**440.639 International Finance (Open Economy Macro)**
This course provides an overview of open economy macroeconomics, and international financial markets and policies. The focus is on exchange rate determination, the importance of the balance of payments for both the domestic economy and the economies of other countries, international capital flows, the impact of internal debt on the balance of trade, and the interaction and potential conflicts between domestic and international economic policy objectives. Prerequisites: 440.602 Macroeconomic Theory. Corequisite: 440.606 Econometrics.

**440.650 Environmental & Resource Economics**
(formerly 440.640) Beginning with the concept of sustainability, the course develops a framework for an economic assessment of environmental problems including the notion of market failure, valuation of environmental resources, and policy design issues associated with using alternative economic incentives and instruments. The second part of the course examines principles of the economically efficient management of non-depletable and depletable (e.g., fossil fuels, natural ecosystems) resources. Various applied settings are used to demonstrate the principles developed in the course. Prerequisites: 440.601 Microeconomic Theory. Corequisite: 440.606 Econometrics.

**440.653 Economics of the Labor Market**
(formerly 440.643) The determination of earnings and the allocation of labor are examined. This course develops the theory of labor markets, focusing on the institutional structure of both labor supply and labor demand. This theory is then applied to questions of income distribution, unions, wage discrimination, wage rigidity, and government policies such as the minimum wage, affirmative action, and training and retraining programs. Prerequisites: 440.601 Microeconomic Theory. Corequisite: 440.606 Econometrics.

**440.656 Political Economy**
(formerly 440.616) This course examines how rational choice methodology (including Game Theory and Neoclassical Economics) can be applied to analyze issues related to political economy. Topics include the origin of state, economic origins of political regimes, different models of voting and their outcomes and different aspects of federalism. This course also explores how political economy influences economic development and public debt. Prerequisite: 440.601 Microeconomic Theory.

**440.658 Industrial Organization**
(formerly 440.658) In this course, the focus is on the study of markets and the laws and regulations used to ameliorate some of their imperfections, especially the problems caused by market structure and market power. Many economic models used to explain how markets work and what is necessary for market power to exist are investigated. Subsequently, the course explores how regulators and private litigants try to eliminate or control market power, particularly through antitrust law, with respect to price fixing, mergers, and market dominance. Regulatory issues pertaining to such industries as telecommunication, transportation, electrical power, health, safety, and the environment are covered. Prerequisites: 440.601 Microeconomic Theory. Corequisite: 440.606 Econometrics.

**440.659 Law and Economics**
(formerly 440.639) Techniques of microeconomic theory and game theory are applied to analyze the effects of various laws on individual decisions and on the allocation of resources. Subject areas covered include the theory of public choice, the economics of property rights, contract law, and tort law. Topics include the efficient breach of contract, the determination of damages, the economics of patents and copyrights, optimal liability rules for environmental and other torts, economics of family law, bankruptcy law, zoning law, antitrust law, and the legal process. Prerequisites: 440.601 Microeconomic Theory. Corequisite: 440.606 Econometrics.

**440.660 Public Economics: Taxation**
(formerly 440.630) This course develops the conceptual framework for analyzing governmental taxation. The theoretical impact of taxes on income distribution and resource allocation will be studied. Then these tools will be used to evaluate the strengths and weaknesses of the current federal tax system as well as various proposals for fundamental tax reform. Prerequisites: 440.601 Microeconomic Theory. Corequisite: 440.606 Econometrics.

**440.661 Public Economics: Expenditure Programs & Social Regulation**
(formerly 440.627) This course analyzes the determinants and properties of government expenditures and social regulation. The first part of the course is generic: It addresses efficiency and equity in income redistribution; the provision of public goods; coping with externalities, addiction and risk; and voting and bureaucracy. The second part of the course is particular: It examines health policy, education policy, statutory pensions, and welfare policy in a comparative international context. Prerequisites: 440.601 Microeconomic Theory. 440.602 Macroeconomic Theory. Corequisite: 440.606 Econometrics.

**440.663 Development Microeconomics**
(formerly 440.623) This course analyzes the constraints on households and policy makers in developing countries using econometric tools. Empirical micro-economic studies of behavior and policy outcomes under different types of market failures are drawn upon. Topics include inter alia inequality, fertility, education, health, poverty, nutrition, and failures in land, labor, credit and insurance markets. Prerequisites: 440.601 Microeconomic Theory. Corequisite: 440.606 Econometrics.

**440.665 International Trade (Open Economy Micro)**
(formerly 440.655) The first part of the course examines the causes of trade, the sources of the gains from trade, and the domestic and international distribution of those gains. In addition, it introduces the politico-economic causes of trade policy and addresses the theory and empirics of trade and growth. The second part examines in detail the instruments and consequences of trade policy, namely tariffs and quantitative restrictions, and their modern manifestation as anti-dumping and safeguard measures. The causes and consequences of trade policy, too, are linked to contemporary empirical evidence.
**440.651 Econometrics.**

Regional economics is a relatively new formal branch of economics which recognizes the crucial importance of geography in the workings of a market economy. By incorporating variables of space and geography into traditional economic models, it has great relevance to real world phenomena and policy questions. We examine the effects of market forces on spatial variables such as the location choices of households and firms; land use policy; labor market agglomeration; urban poverty; the development of transportation infrastructure; and urban and rural housing markets. The roles of natural resources, demographic base, location of industries, and factors determining regional growth and development will also be considered. Prerequisites: 440.601 Microeconomic Theory; 440.606 Econometrics.

**440.671 Wine Economics**

(formerly 440.651) This course will survey theoretical and empirical analyses across the breadth and depth of wine economics through examination of the wine economics literature and practice. Topics covered include factors affecting the demand and supply of wine; determination of the price of wine; wine futures pricing; wine as an investment good; the production process for wine; wine in international trade and finance; the agricultural basis of wine; and human capital aspects of wine consumption. The course will suggest the unique, global research potential of wine economics. This class will also include an experiential component through visits to several local area wineries. Prerequisites: 440.601 Microeconomic Theory; 440.602 Macroeconomic Theory; 440.606 Econometrics.

**440.675 Economics of National Security**

(formerly 440.645) This course analyzes the microeconomic theory of defense acquisition and the government’s attempts to escape the monopoly/monopsony dilemma in a high tech, high investment industry; the finances and business strategies of defense companies; defense budgeting problems, prospects, and procedures; and applications of economic thinking to military and national strategy. Prerequisites: 440.601 Microeconomic Theory; 440.602 Macroeconomic Theory. Corequisite: 440.606 Econometrics.

**440.692 Thesis**

Students may undertake their own research project for credit as an 11th program course. Prior to proposing a project, interested students must have clearly identified a research topic, and a mentor who is familiar with their prospective inquiry, and is willing to provide guidance and oversee the project. The mentor must be faculty teaching at the Johns Hopkins University. Students then submit a formal proposal for review and approval to the Independent Research Committee, to be received no later than one month prior to the beginning of the term in which the student plans to enroll in the course. Students must meet with the mentor and the faculty advisor periodically for discussion of the project’s progress, and must complete a research paper, to be approved by the mentor and the Committee. The best papers will be made available to the public on Hopkins’ electronic research repository JScholarship. Instructions for applying to enroll and meeting the standards of the course are available. Enrollment of the student can only be undertaken by the Program Director. Candidates must plan on using two semesters to successfully complete an Independent Research project. Prerequisites: All four Core courses and Microeconometrics or Macroeconometrics, and one or more Advanced Economics courses in the substantive area of the proposed research, plus a strong academic record (at least B+ average) in at least eight program courses, are absolute minima. Admission is by selection.

**440.888 Continuation (Applied Economics)**

(formerly 440.656) Students not finishing their paper during the term in which they enroll must register for Continuation in every ensuing semester (including Summer) until their papers are accepted, but Continuation does not count as a separate course. Such students must pay a continuation-of-enrollment fee of $500 for each subsequent term until a final grade has been submitted. In Applied Economics, taking Continuation once may be considered the norm. Prerequisite: 440.692 Thesis.
The Center for Biotechnology Education, established in 2010, expands the scope of biotechnology education at home and abroad to build a pipeline of students and professionals ready to succeed in graduate school, K-12 education, and the work environment in the fields of biotechnology, bioinformatics, regulatory science and bioscience business and leadership. The mission of the Center for Biotechnology Education is to increase public awareness and understanding of biotechnology, inform educators of the resources and programs available locally and nationally, become a resource center for biotechnology information, coordinate training workshops for students and professionals, and to secure funds in support of biotechnology training and education locally, nationally and internationally. The goals of the Center are to develop partnerships with industry and government organizations to provide community outreach, professional development educational opportunities, workshops, research symposia, and lecture series for academia, industry and the general public.

Biotechnology, the application of biological systems to solve problems or make useful products, continues to expand with new discoveries and life-saving products at a breathtaking pace. The biotechnology industry harnesses advances in microbiology, cell biology, molecular biology, genomics, and proteomics to move discoveries and ideas out of the laboratory and into the product development pipeline. This dynamic field demands a multidisciplinary workforce skilled in basic research, drug discovery technologies, bioinformatics, regulatory affairs and product commercialization.

Johns Hopkins University (JHU) offers students the ability to learn, advance and succeed in this exciting field, with a variety of learning opportunities designed to meet the needs of working adults. Classes may be taken at two regional campuses: Rockville and Baltimore, MD, and in our cyber campus for our online courses. Students may choose from five different degree options and four certificates offered through the Center’s Advanced Biotechnology Studies Program:

- Master of Science in Bioinformatics (a joint offering of the Krieger School of Arts and Sciences and Whiting School of Engineering)
- Master of Science in Biotechnology
- Master of Science in Biotechnology with a concentration in Biodefense and Certificate in National Security Studies
- Master of Science in Biotechnology/MBA, (a dual degree program offered with the Carey Business School)
- Master of Biotechnology Enterprise and Entrepreneurship
- Master of Science in Food Safety Regulation
- Master of Science in Regulatory Science
- Certificate in Biotechnology Education
- Certificate in Biotechnology Enterprise
- Post-Master’s Certificate in Sequence Analysis and Genomics

**PROGRAM COMMITTEE**

- Bertrand Garcia-Moreno
  Professor; Chair, Center for Biotechnology Education, Advanced Biotechnology Studies
- Kristina Obom
  Program Director, Biotechnology and Bioinformatics; Center Director, Center for Biotechnology Education
- Patrick Cummings
  Program Director, Biotechnology
- Lynn Johnson Langer
  Program Director, Enterprise and Regulatory Science
- Alexandra Tan
  Program Director, Health Science Intensive
- Robert Lessick
  Associate Program Director, Online Education
- Thomas E. Colonna
  Associate Program Director, Regulatory Science & Food Safety Regulation

**FULL-TIME FACULTY AND STAFF**

- Beatrice Kondo
  Lecturer and Coordinator, Bioinformatics
- Thomas Koval
  Lecturer
- Sherry Ogg
  Lecturer
- Meredith Safford
  Lecturer and Coordinator, Biotechnology
- Roza Selimyan
  Lecturer and Coordinator, Health Science Intensive
- Katherine Wellman
  Lecturer and Coordinator, Biotechnology Enterprise and Entrepreneurship
- Karen Wells
  Lecturer
Johns Hopkins University (JHU) offers an innovative graduate program that prepares professionals for success in bioinformatics. Drawing from the strengths of the Krieger School of Arts and Sciences and the Whiting School of Engineering, this program fully integrates the computer science, bioscience, and bioinformatics needed to pursue a career in this dynamic field.

Students take 11 courses to complete the degree, 5 core courses, 4 concentration courses, an elective from bioscience and an elective from computer science. After completion of the core and concentration courses, students may choose an independent study project. Students have up to five years to complete the program.

This program is designed for working adults. All classes are offered in the evening, on Saturdays or online. Please note that not every course is available at all onsite locations. All degree requirements can be completed at the Montgomery County Campus or online. Not all courses are offered at the Homewood campus.

Fully Online MS in Bioinformatics
In order to meet the needs of students who require flexibility in scheduling or who cannot relocate to the Baltimore/Washington area, we now offer an option to complete the MS in Bioinformatics degree fully online. Our unique model for online education ensures students the same academic program as our onsite students, and engages students through a variety of asynchronous interactions. Students interact with the instructor and other students through threaded discussions, group projects, and informal meetings such as chats and question and answer sessions. Course content is delivered via text notes, PowerPoint, narrated PowerPoint, streaming video and web-conferencing in order to meet the needs of various learning styles.

MS in Bioinformatics with Thesis Option
Students interested in pursuing the MS in Bioinformatics with the thesis are required to take 12 courses. The thesis requires a two-semester research project. Students complete 410.800 Independent Research Project (Biotechnology) first, and the following semester 410.801 Biotechnology Thesis. Students interested in this option should consult with the program advisor.

ADMISSION REQUIREMENTS

Credentials and Prerequisite Courses

- An undergraduate degree in the biological sciences or in engineering with at least a 3.0 on a 4.0 scale. All the prerequisites listed below can be taken from the existing Master of Science in Computer Science or the Master of Science in Biotechnology Program. Students who have not completed all the prerequisites may be admitted provisionally to complete the admission requirements.
  - Two semesters of Organic Chemistry (or 410.302 Bio-Organic Chemistry)
  - One semester of Biochemistry (or 410.601 Biochemistry)
  - Introduction to Programming Using Java, C++, or C (or 605.201 Introduction to Programming Using Java)
> Data Structures (or 605.202 Data Structures)
> One course in Probability and Statistics (or 410.645 Biostatistics)
> Calculus
> The admissions committee reserves the right to request additional information from applicants such as GRE or letters of recommendation, if needed, to assess their candidacy for admission.

Application Documents
> AAP application and fee
> A résumé or curriculum vitae
> Official undergraduate transcript
> 500-word statement of purpose
> TOEFL score for international students (minimum score on Internet based test is 100)

Admission Status
Please see Student Status for descriptions and criteria of the different categories of student status.

COURSE REQUIREMENTS

Core Courses
Five total
410.602 Molecular Biology
410.610 Gene Organization & Expression
410.633 Introduction to Bioinformatics OR 605.452 Biological Databases and Database Tools
410.634 Practical Computer Concepts for Bioinformatics OR 605.441 Principles of Database Systems
605.421 Foundations of Algorithms OR 605.420 Algorithms for Bioinformatics

Concentration Courses
Choose four
410.635 Bioinformatics: Tools for Genome Analysis
410.639 Protein Bioinformatics
410.640 Molecular Phylogenetic Techniques
410.661 Methods in Proteomics
410.666 Next Generation DNA Sequencing and Analysis
410.671 Microarrays & Analysis
410.698 Bioperl
410.712 Advanced Practical Computer Concepts for Bioinformatics
410.713 Advanced Genomics and Genetic Analysis
410.734 Practical Introduction to Metagenomics
410.736 Genomic and Personalized Medicine
605.443 The Semantic Web
605.451 Principles of Computational Biology
605.453 Computational Genomics
605.456 Computational Drug Discovery and Development

605.716 Modeling and Simulation of Complex Systems
605.751 Computational Aspects of Molecular Structure
605.754 Analysis of Gene Expression and High-Content Biological Data
605.755 Systems Biology

Electives
Choose one from Computer Science and one from Biotechnology

Computer Science
605.401 Foundations of Software Engineering
605.444 XML Design Paradigms
605.462 Data Visualization
605.481 Principles of Enterprise Web Development
605.484 Agile Development with Ruby on Rails
605.486 Mobile Application Development for the Android Platform
605.701 Software Systems Engineering
605.741 Distributed Database Systems: Cloud Computing and Data Warehouses
605.746 Machine Learning
605.747 Evolutionary Computation
605.759 Independent Research Project in Bioinformatics
605.782 Web Applications Development with Java
605.787 Rich Internet Applications with Ajax
605.788 Big Data Processing Using Hadoop

Biotechnology
410.603 Advanced Cell Biology I
410.604 Advanced Cell Biology II
410.612 Human Molecular Genetics
410.613 Principles of Immunology
410.615 Microbiology
410.616 Virology
410.622 Molecular Basis of Pharmacology
410.629 Genes & Disease
410.630 Gene Therapy
410.632 Emerging Infectious Diseases
410.638 Cancer Biology
410.641 Clinical & Molecular Diagnostics
410.648 Clinical Trial Design and Conduct
410.656 Recombinant DNA Laboratory
410.752 High Throughput Screening & Automation Laboratory
410.800 Independent Research Project in Biotechnology

ENGINEERING FOR PROFESSIONALS

COURSE DESCRIPTIONS
See "Biotechnology Studies Course Descriptions" on page 58 for descriptions of 410-courses.

Prerequisites Courses
605.201 Introduction to Programming Using Java
This course enables students without a background in software development to become proficient programmers who are prepared for a follow-on course in data structures. The Java
language will be used to introduce foundations of structured, procedural, and object-oriented programming. Topics include I/O, data types, operators, operands, expressions, conditional statements, iteration, recursion, arrays, functions, parameter passing, and returning values. Students will also be introduced to classes, objects, object references, inheritance, polymorphism, and exception handling. Additional topics include file I/O, searching, sorting, Java Collections, and an introduction to Applets. Students will complete several programming assignments to develop their problem-solving skills and to gain experience in detecting and correcting software errors. Prerequisites: One year of college mathematics.

605.202 Data Structures
This course investigates abstract data types (ADTs), recursion, algorithms for searching and sorting, and basic algorithm analysis. ADTs to be covered include lists, stacks, queues, priority queues, trees, sets, and dictionaries. The emphasis is on the tradeoffs associated with implementing alternative data structures for these ADTs. There will be four or five substantial Java programming assignments. Prerequisites: One year of college mathematics. 605.201 Introduction to Programming Using Java or equivalent.

Core Courses

605.420 Algorithms for Bioinformatics
This follow-on course to data structures (e.g., 605.202) provides a survey of computer algorithms, examines fundamental techniques in algorithm design and analysis, and develops problem-solving skills required in all programs of study involving computer science. Topics include advanced data structures (red-black and 2-3-4 trees, union-find), algorithm analysis and computational complexity (recurrence relations, big-O notation, introduction to NP completeness), sorting and searching, design paradigms (divide and conquer, greedy heuristic, dynamic programming), and graph algorithms (depth-first and breadth-first search, connectivity, minimum spanning trees, network flow). Advanced topics are selected from among the following: randomized algorithms, information retrieval, string and pattern matching, and computational geometry. Prerequisites: 605.202 Data Structures or equivalent. 605.203 Discrete Mathematics or equivalent is recommended.

605.441 Principles of Database Systems
This course examines the underlying concepts and theory of database management systems. Topics include database system architectures, data models, query languages, conceptual and logical database design, physical organization, and transaction management. The entity-relationship model and relational model are investigated in detail, object-oriented databases are introduced, and legacy systems based on the network and hierarchical models are briefly described. Mappings from the conceptual level to the logical level, integrity constraints, dependencies, and normalization are studied as a basis for formal design. Theoretical languages such as the relational algebra and the relational calculus are described, and high-level languages such as SQL and QBE are discussed. An overview of file organization and access methods is provided as a basis for discussion of heuristic query optimization techniques. Finally, transaction-processing techniques are presented with a specific emphasis on concurrency control and database recovery.

605.452 Biological Databases and Database Tools
The sequencing of the human genome and intense interest in proteomics and molecular structure have resulted in an explosive need for biological databases. This course surveys a wide range of biological databases and their access tools and enables students to develop proficiency in their use. Databases introduced include genome and sequence databases such as GenBank and Ensemble, as well as protein databases such as PDB and SWISS-PROT. Tools for accessing and manipulating sequence databases such as BLAST, multiple alignment, Perl, and gene finding tools are covered. Specialized databases such as KEGG and HapMap are surveyed for their design and use. The course also focuses on the design of biological databases and examines issues related to heterogeneity, interoperability, complex data structures, object orientation, and tool integration. Students will create their own small database as a course project and will complete homework assignments using biological databases and database tools. Prerequisites: 605.205 Molecular Biology for Computer Scientists or equivalent. 605.441 Principles of Database Systems or 410.634 Practical Computer Concepts for Bioinformatics recommended.

Concentration Courses

605.443 The Semantic Web
The Semantic Web is an activity by the WWV Consortium to create a large set of XML-based languages, along with information on how various tags relate to real-world objects and concepts. This course covers Semantic Web technologies, including RDF (Resource Description Format, a structure for describing and interchanging metadata on the web) and OWL (Web Ontology Language), with domain-specific standards and ontologies (formal specifications of how to represent objects and concepts). Representative applications of RDF, OWL, and
ontologies will be discussed. Students will complete a Semantic Web project in an application area of interest to them. Examples will be drawn from several application areas. Prerequisites: 605.444 XML Design Paradigms or equivalent.

605.451 Principles of Computational Biology
This course is an interdisciplinary introduction to computational methods used to solve important problems in DNA and protein sequence analysis. The course focuses on algorithms but includes material to provide the necessary biological background for science and engineering students. Algorithms to be covered include dynamic programming for sequence alignment, such as Smith-Waterman, FASTA, and BLAST; hidden Markov models, such as the forward, Viterbi, and expectation maximization algorithms; a range of gene-finding algorithms; phylogenetic tree construction; and clustering algorithms. Prerequisites: Familiarity with probability and statistics; working knowledge of Java, C++, or C; 605.205 Molecular Biology for Computer Scientists or a course in molecular biology; and either a course in cell biology or biochemistry.

605.453 Computational Genomics
This course focuses on current problems of computational genomics. Students will explore bioinformatics software, discuss bioinformatics research, and learn the principles underlying a variety of bioinformatics algorithms. The emphasis is on algorithms that use probabilistic and statistical approaches. Topics include analyzing eukaryotic, bacterial, and viral genes and genomes, genome sequencing and assembling, finding genes in genomes and identifying their biological functions, predicting regulatory sites, and assessing gene and genome evolution. Prerequisites: 605.205 Molecular Biology for Computer Scientists or equivalent and familiarity with probability and statistics.

605.456 Computational Drug Discovery and Development
Recent advances in bioinformatics and drug discovery platforms have brought us significantly closer to the realization of rational drug design and development. Across the pharmaceutical industry, considerable effort is being invested in developing experimental and translational medicine, and it is starting to make a significant impact on the drug discovery process itself. This course examines the major steps of the evolving modern drug discovery platforms, the computational techniques and tools used during each step of rational drug discovery, and how these techniques facilitate the integration of experimental and translational medicine with the discovery/development platforms. The course will build on concepts from a number of areas including bioinformatics, computational genomics/proteomics, in silico system biology, computational medicinal chemistry, and pharmaceutical biotechnology. Topics covered in the course include comparative pharmacogenomics, protein/antibody modeling, interaction and regulatory networks, QSAR/pharmacophores, ADME/toxicology, and clinical biomarkers. Relevant mathematical concepts are developed as needed in the course. Prerequisites: 605.205 Molecular Biology for Computer Scientists or equivalent.

605.716 Modeling and Simulation of Complex Systems
This course focuses on the application of modeling and simulation principles to complex systems. A complex system is a large-scale nonlinear system consisting of interconnected or interwoven parts (such as a biological cell, the economy, or an ecological system). The course begins with an overview of complex systems, followed by modeling and simulation techniques based on nonlinear differential equations, networks, stochastic models, cellular automata, and swarm-like systems. Existing software systems will be used to illustrate systems and provide practical experience. During the semester, each student will complete a modeling project of a complex system. While this course is intended for computer science or engineering students interested in modeling any complex system, it may also be taken by bioinformatics students interested in modeling complex biological systems. Students interested in bioinformatics will study a parallel track exposing them to existing whole-cell modeling tools such as E-Cell, COPASI, and BioSpice. Prerequisites: Knowledge of elementary probability and statistics and previous exposure to differential equations. Students applying this course to the MS in Bioinformatics should also have completed at least one Bioinformatics course prior to enrollment.

605.751 Computational Aspects of Molecular Structure
This course focuses on computational methods for studying protein and RNA structure, protein-protein interactions, and biological networks. Algorithms for prediction of RNA secondary structure, protein-protein interactions, and annotation of protein secondary/tertiary structure and function are studied in depth. Students will apply various computer programs and structure-visualization software to secondary and tertiary protein structure prediction, structure-structure comparison, protein domain classification, annotation of functionally important sites, and protein design. Interesting aspects of protein interaction and metabolic networks are also discussed. Prerequisites: 605.205 Molecular Biology for Computer Scientists or equivalent. 605.451 Principles of Computational Biology is recommended.

605.754 Analysis of Gene Expression and High-Content Biological Data
The development of microarray technology, rapid sequencing, protein chips, and metabolic data has led to an explosion in the collection of “high-content” biological data. This course explores the analysis and mining of gene expression data and high-content biological data. A survey of gene and protein arrays, laboratory information management systems, data normalization, and available tools is followed by a more in-depth treatment of differential gene expression detection, clustering techniques, pathway extraction, network model building, biomarker evaluation, and model identification. Both clinical and research data will be considered. The student will develop skills in statistical analysis and data mining, including statistical detection theory, nonlinear and multiple regression, entropy measurement, detection of hidden patterns in data, heuristic search, and learning algorithms. Applied mathematical concepts and biological principles will be introduced, and students will focus on algorithm design and software application for designing and implementing novel ways of analyzing
gene, protein, and metabolic expression data. Students will complete data analysis assignments individually and in small teams. Prerequisites: 605.205 or equivalent or a prior course in bioinformatics, a course in probability and statistics, and ability to program in a high-level language.

605.755 Systems Biology
During the last decade, systems biology has emerged as an effective tool for investigation of complex biological problems, placing emphasis on the analysis of large-scale data sets and quantitative treatment of experimental results. In this course, students will explore recent advances in systems biology analysis of intracellular processes. Examples of modeling and experimental studies of metabolic, genetic, signal transduction, and cell cycle regulation networks will be studied in detail. The classes will alternate between consideration of network-driven and network element (gene, metabolite, or protein)- driven approaches. Students will learn to use Boolean, differential equations, and stochastic methods of analysis and will become acquainted with several powerful experimental techniques, including basics of microfabrication and microfluidics. For their course projects, students will develop models of a signal transduction or metabolic pathway. Prerequisites: Courses in molecular biology (605.205 Molecular Biology for Computer Scientists or 410.602 Molecular Biology) and differential equations.

Computer Science Electives

605.401 Foundations of Software Engineering
Fundamental software engineering techniques and methodologies commonly used during software development are studied. Topics include various life cycle models, project planning and estimation, requirements analysis, program design, construction, testing, maintenance and implementation, software measurement, and software quality. Emphasized are structured and object-oriented analysis and design techniques, use of process and data models, modular principles of software design, and a systematic approach to testing and debugging. The importance of problem specification, programming style, periodic reviews, documentation, thorough testing, and ease of maintenance are covered.

605.444 XML Design Paradigms
The course explores understanding the tradeoffs among XML grammars and XML techniques to solve different classes of problems. Topics include optimization of XML grammars for different XML technologies; benefits of using different XML schema languages; tradeoffs in using different parsing approaches; benefits of parsing technology vs. XML query; the role of Web 2.0 to deliver functionality through various web services approaches; exploiting XML to drive audio, visual, and tactile displays; the role of XML in multiplying the power of standard web browser technologies; and the role of Web 3.0 to deliver Semantic Web functionality. XML technologies that will be covered include XML Schema, XPath, XSLT, SAX, DOM, XQuery, SOAP, WSDL, JAX-B, JAXB, REST, RDF, and OWL. Prerequisites: 605.481 Principles of Enterprise Web Development or equivalent Java experience.

605.462 Data Visualization
This course explores the underlying theory and practical concepts in creating visual representations of large amounts of data. It covers the core topics in data visualization: data representation, visualization toolkits, scientific visualization, medical visualization, information visualization, flow visualization, and volume rendering techniques. The related topics of applied human perception and advanced display devices are also introduced. Prerequisites: Experience with data collection/analysis in data-intensive fields or background in computer graphics (e.g., 605.467 Computer Graphics) is recommended.

605.481 Principles of Enterprise Web Development
This course examines three major topics in the development of applications for the World Wide Web. The first is website development using HTML and related standards. The second is the implementation of client-side applications using the Java programming language, including user interface development, asynchronous event handling, multithreaded programming, and network programming. Distributed object protocols via RMI or CORBA and distributed database access via JDBC may also be introduced. The third topic is the design of server-side web applications, for which students will examine the underlying web protocol (HTTP), the development of client-side interfaces (e.g., via HTML forms), and the implementation of server-side programs (e.g., via Java servlets or traditional CGI).

605.484 Agile Development with Ruby on Rails
Modern web applications are expected to facilitate collaboration, with user participation being a significant facet of the system. Components such as wikis, blogs, and forums are now commonplace. While feature sets continue to expand, there is continuing pressure to develop and deploy capabilities more quickly to enable organizations to remain competitive. This pressure has led to the development of languages and frameworks geared toward rapid prototyping, with Ruby on Rails being the most popular. Ruby on Rails is a model-view-controller (MVC) framework that enables efficient application development and deployment. Techniques such as convention over configuration and object-relational mapping with ActiveRecord along with enhanced AJAX support offer a simple environment with significant productivity gains. This code-intensive course introduces Ruby on Rails, the patterns it implements, and its applicability to the rapid development of collaborative applications. Prerequisites: 605.481 Principles of Enterprise Web Development or equivalent.

605.486 Mobile Application Development for the Android Platform
This project-oriented course will investigate the issues surrounding application development for mobile platforms. First, we will look at techniques for building applications that adapt to the ways in which mobile apps differ from traditional desktop or web-based apps: constrained resources, small screen sizes, varying display resolutions, intermittent network connectivity, specialized sensors, security restrictions, and so forth. Second, we will look at best practices for making mobile applications flexible: using XML-based layouts, managing multimedia, storing user data, networking via Bluetooth and
WiFi, determining device location and orientation, deploying applications, and gracefully handling shutdowns and restarts to the application. Optional topics may include embedding web components with WebKit, showing maps with the Google Maps plug-in, and storing local data with SQLite. Students will be provided links to download free tools for building and testing Android apps; there is no requirement that students own a physical Android device. Prerequisites: 605.481 Principles of Enterprise Web Development or equivalent Java experience.

605.701 Software Systems Engineering
Software systems engineering applies engineering principles and the system view to the software development process. The course focuses on the engineering of complex systems that have a strong software component. This course is based on the philosophy that the key to engineering a good software system lies just as much in the process that is followed as in the purely technical regime. The course will show how good a software development process is and how to make a software process better by studying successful techniques that have been employed to produce correct software systems within budget. Topics are explored in a sequence designed to reflect the way one would choose to implement process improvements. These topics include steps to initiate process change, methods to establish control over the software process, ways to specify the development process, methods for quantitative process control, and how to focus on problem prevention. Students will prepare term projects. Prerequisites: One software engineering course beyond 605.401 Foundations of Software Engineering.

605.741 Distributed Database Systems: Cloud Computing and Data Warehouses
This course investigates the architecture, design, and implementation of massive-scale data systems. The course discusses foundational concepts of distributed database theory including design and architecture, security, integrity, query processing and optimization, transaction management, concurrency control, and fault tolerance. It then applies these concepts to both large-scale data warehouse and cloud computing systems. The course blends theory with practice, with each student developing both distributed database and cloud computing projects. Prerequisites: 605.441 Principles of Database Systems and 605.481 Principles of Enterprise Web Development or equivalent knowledge of Java and HTML. Familiarity with “big-O” concepts and notation is recommended.

605.746 Machine Learning
How can machines improve with experience? How can they discover new knowledge from a variety of data sources? What computational issues must be addressed to succeed? These are questions that are addressed in this course. Topics range from determining appropriate data representation and models for learning, understanding different algorithms for knowledge and model discovery, and using sound theoretical and experimental techniques in assessing performance. Specific approaches covered include statistical techniques (e.g., k- nearest neighbor and Bayesian learning), logical techniques (e.g., decision tree and rule induction), function approximation (e.g., neural networks and kernel methods), and reinforcement learning. The topics are discussed in the context of current machine learning and data mining research. Students will participate in seminar discussions and will complete and present the results of an individual project. Prerequisites: 605.445 Artificial Intelligence is recommended but not required.

605.747 Evolutionary Computation
Recently, principles from the biological sciences have motivated the study of alternative computational models and approaches to problem solving. This course explores how principles from theories of evolution and natural selection can be used to construct machines that exhibit nontrivial behavior. In particular, the course covers techniques from genetic algorithms, genetic programming, and artificial life for developing software agents capable of solving problems as individuals and as members of a larger community of agents. Specific topics addressed include representation and schemata; selection, reproduction, and recombination; theoretical models of evolutionary computation; optimal allocation of trials (i.e., bandit problems); search, optimization, and machine learning; evolution of programs; population dynamics; and emergent behavior. Students will participate in seminar discussions and will complete and present the results of an individual project. Prerequisites: 605.445 Artificial Intelligence is recommended but not required.

605.759 Independent Research Project in Bioinformatics
This course is for students who would like to carry out a significant project in bioinformatics as part of their graduate program. The course may be used to conduct minor research, an in-depth literature survey, or a software implementation related to recent developments in the field. Students who enroll in this course are encouraged to attend at least one industry conference in bioinformatics that is related to their area of study. To enroll in this course, the student must be within two courses of degree completion and must obtain the approval and support of a sponsoring faculty member.

605.782 Web Applications Development with Java
This project-oriented course will enable the students to use various techniques for building browser-based applications for dynamically generated websites, e-commerce, web-enabled enterprise computing, and other applications that require web access to server-based resources. Particular attention will be paid to methods for making web-based applications efficient, maintainable, and flexible. The course will use at least two sets of tools: servlets/JSP and a higher-level Java-based framework such as JSF 2.0. Major topics will include handling HTTP request information, generating HTTP response data, tracking sessions, designing custom tag libraries or components, page templating, asynchronous page updates with Ajax, and separating content from presentation through use of the MVC architecture. Additional topics may include HTML5, database access techniques for web apps, web app security, and dependency injection in web apps (e.g., with the Spring framework). Prerequisites: 605.481 Principles of Enterprise Web Development or equivalent Java experience.

605.787 Rich Internet Applications with Ajax
Using a web browser to access online resources is convenient because it provides universal access from any computer on
any operating system in any location. Unfortunately, it often results in a poor user experience because HTML is a weak and noninteractive display language and HTTP is a weak and inefficient protocol. Full-fledged browser-embedded programs (e.g., ActiveX components, Java applets) have not succeeded in penetrating the market adequately, so a new class of applications has grown up that uses only the capabilities already available in most browsers. These applications were first popularized by Google but have since exploded in popularity throughout the developer community. The techniques to implement them were based on a group of technologies collectively known as Ajax, and the resultant applications were richer than the relatively static pure-HTML-based web applications that preceded them. These applications have become known as Ajax applications, rich internet applications, or Web 2.0 applications. This course will examine techniques to develop and deploy Ajax applications. We will look at the underlying techniques, then explore client-side tools (e.g., scriptaculous), server-side tools (e.g., Direct Web Remoting), and hybrid tools (e.g., the Google Web Toolkit) to simplify the development process. We will also examine closely related technologies such as Flash/Flex and OpenLaszlo, along with the accompanying issues of usability, efficiency, security, and portability. Prerequisites: 605.782 Web Application Development with Java or equivalent servlet and JSP experience.

605.788  Big Data Processing Using Hadoop
Organizations today are generating massive amounts of data that are too large and too unwieldy to fit in relational databases. So, organizations and enterprises are turning to massively parallel computing solutions such as Hadoop for help. The Apache Hadoop platform, with Hadoop Distributed File System (HDFS) and MapReduce (M/R) framework at its core, allows for distributed processing of large data sets across clusters of computers using the map and reduce programming model. It is designed to scale up from a single server to thousands of machines, offering local computation and storage. The Hadoop ecosystem is sizable in nature and includes many subprojects such as Hive and Pig for big data analytics, HBase for real-time access to big data, Zookeeper for distributed transaction process management, and Oozie for workflow. This course breaks down the walls of complexity of distributed processing of big data by providing a practical approach to developing applications on top of the Hadoop platform. By completing this course, students will gain an in-depth understanding of how MapReduce and Distributed File Systems work. In addition, they will be able to author Hadoop-based MapReduce applications in Java and also leverage Hadoop subprojects to build powerful data processing applications. Prerequisites: 605.481 Principles of Enterprise Web Development or equivalent Java experience.
Master of Science in Biotechnology

biotechnology.jhu.edu

ADMISSION REQUIREMENTS

Credentials and Prerequisite Courses
An undergraduate degree in the natural sciences or in engineering with at least a 3.0 on a 4.0 scale in undergraduate studies (relevant work experiences are also considered); applicants with degrees in other disciplines may be able to enroll if their undergraduate work included the prerequisite courses that follow:

> Two semesters of biology
> Two semesters of college chemistry, preferably with laboratories
> Two semesters of organic chemistry, preferably with laboratories; students without adequate organic chemistry may be admitted provisionally to take 410.302 Bio-Organic Chemistry

The admissions committee reserves the right to request additional information, such as a GRE score or letters of recommendation, from applicants to assess their candidacy for admission.

Application Documents

> AAP application and fee
> Résumé or curriculum vitae
> Official undergraduate transcript
> 500-word statement of purpose
> TOEFL score for international students
> Three letters of recommendation are required only for the fellowship applications

Admission Status
Please see Student Status for descriptions and criteria of the different categories of student status.

COURSE REQUIREMENTS

> Four core courses:
  410.601 Biochemistry
  410.602 Molecular Biology
  410.603 Advanced Cell Biology I
  410.604 Advanced Cell Biology II
> Six elective courses (see course descriptions, must include at least two science electives)
> Course requirements differ for the certificate and concentration programs

PROGRAM COMMITTEE

Bertrand Garcia-Moreno
Chair, Center for Biotechnology Education, Advanced Biotechnology Studies

Kristina Obom
Program Director, Biotechnology and Bioinformatics; Center Director, Center for Biotechnology Education

Patrick Cummings
Program Director, Biotechnology

Lynn Johnson Langer
Program Director, Enterprise and Regulatory Science

FELLOWSHIP PROGRAMS
The Johns Hopkins University (JHU) Advanced Biotechnology Studies Program, with our partners at the Center for Cancer Research/National Cancer Institute (CCR/NCI) and the United States Army Medical Research Institute of Infectious Diseases (USAMRIID) have developed two innovative graduate fellowships that prepare the next generation of scientists in the emerging fields of drug discovery and biodefense. These fellowships in Molecular Targets and Drug Discovery Technologies and Biodefense fully integrate the didactic training and hands-on laboratory experience required for graduates to contribute to the advancement of knowledge and research in these fields. Fellows earn an MS in Biotechnology with a concentration in Molecular Targets and Drug Discovery Technologies or Biodefense, participate in important basic and applied research, work in CCR/NCI or USAMRIID laboratories, and receive paid tuition for up to two years plus an annual
stipend. Fellows receive the stipend only if they are accepted into the Master of Science in Biotechnology and one of the fellowship programs.

DEGREE AND FELLOWSHIP REQUIREMENTS AND PREREQUISITES

Degree

> An undergraduate degree in the natural sciences or in engineering with at least a 3.0 on a 4.0 scale
> Two semesters of Organic Chemistry with labs

Fellowship

> One course in probability and statistics or biostatistics
> Graduate of an accredited university/college
> A US citizen or permanent resident

For information about concentration requirements, see Concentration in Biodefense or Concentration in Molecular Targets and Drug Discovery Technologies. Consult program advisor.

MS IN BIOTECHNOLOGY DEGREE CONCENTRATIONS (OPTIONAL)

Students wishing to focus on a specialized discipline within the MS in Biotechnology Program may enroll in one of six concentrations: Biodefense (with an optional combined credential of a Certificate in National Security Studies), Bioinformatics, Biotechnology Enterprise, Molecular Targets and Drug Discovery Technologies, Bioscience Regulatory Affairs, or Health Science Intensive (HSI). The Molecular Targets and Drug Discovery Technologies and the HSI concentrations are only offered at JHU’s Montgomery County Campus in Rockville, Maryland.

Concentration in Biodefense

The biodefense concentration integrates basic and translational science to train the next generation of professionals for employment in academia, industry and government. The curriculum provides students with a solid foundation in basic science, and investigates the various applications of medical science and biotechnology for detection, identification and response to bio threats.

Specific disciplines of study include molecular biology, infectious diseases, bioinformatics, immunology, epidemiology, molecular diagnostics and policy.

Core Science Courses

Core requirements differ for this concentration

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>410.601</td>
<td>Biochemistry</td>
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<tr>
<td>410.602</td>
<td>Molecular Biology</td>
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<td>410.603</td>
<td>Advanced Cell Biology I</td>
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<tr>
<td>410.633</td>
<td>Introduction to Bioinformatics</td>
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<tr>
<td>410.692</td>
<td>Biological &amp; Chemical Threat Response &amp; Forensics</td>
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<tr>
<td>410.693</td>
<td>Science, Medicine and Policy in Biodefense</td>
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One Laboratory Course (410.652, 410.656, 410.657, 410.658, 410.659, 410.660, 410.731 or 410.752)

Biodefense Electives

Choose three

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>410.604</td>
<td>Advanced Cell Biology II</td>
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<tr>
<td>410.611</td>
<td>Vaccinology</td>
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<td>410.613</td>
<td>Principles of Immunology</td>
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<td>410.614</td>
<td>Pathogenic Bacteriology</td>
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<td>410.615</td>
<td>Microbiology</td>
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<td>410.616</td>
<td>Virology</td>
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<td>410.618</td>
<td>Parasitology</td>
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<td>410.621</td>
<td>Agricultural Biotechnology</td>
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<td>410.631</td>
<td>Infectious Diseases</td>
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<tr>
<td>410.632</td>
<td>Emerging Infectious Diseases</td>
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<td>410.639</td>
<td>Protein Bioinformatics</td>
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<td>410.640</td>
<td>Molecular Phylogenetic Techniques</td>
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<td>410.641</td>
<td>Clinical and Molecular Diagnostics</td>
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<td>410.645</td>
<td>Biostatistics</td>
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<td>410.652</td>
<td>Cell Culture Techniques</td>
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<td>410.655</td>
<td>Radiation Biology</td>
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<td>410.656</td>
<td>Recombinant DNA Laboratory</td>
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<td>410.658</td>
<td>Biodefense and Infectious Disease Laboratory Methods</td>
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<td>410.659</td>
<td>Advanced Recombinant DNA Lab</td>
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<td>410.660</td>
<td>Immunological Techniques in Biotechnology</td>
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<td>410.661</td>
<td>Methods in Proteomics</td>
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<td>410.662</td>
<td>Epidemiology; Diseases in Populations</td>
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<td>410.666</td>
<td>Next Generation DNA Sequencing and Analysis</td>
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<td>410.667</td>
<td>Theory/Application of Immunoassays</td>
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<td>410.669</td>
<td>Immunology of Infectious Diseases</td>
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<td>410.671</td>
<td>Microarrays and Analysis</td>
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<td>410.696</td>
<td>Bioassay Development</td>
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<tr>
<td>410.731</td>
<td>Bioprocessing and Scale-Up Laboratory</td>
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<tr>
<td>410.752</td>
<td>High Throughput Screening &amp; Automation Lab</td>
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MS in Biotechnology, Concentration in Biodefense/National Security Studies (NSS) Certificate

Students pursuing a biodefense concentration with an interest in national security policy can obtain an additional credential by completing three additional courses offered by the National Security Studies Certificate Program in AAP. This combined credential will provide professionals with the policy language of national security along with the scientific expertise garnered through the MS in Biotechnology with a biodefense concentration. This combined credential will require students to complete 13 courses.

NSS Certificate requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>470.606</td>
<td>American National Security</td>
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</table>
Choose four Biotechnology Enterprise Concentration Courses

410.649  Introduction to Regulatory Affairs
410.650  Legal Aspects of Biotechnology
410.651  Clinical Development of Drugs and Biologics*
410.665  Bioscience Communication
410.678  Marketing in a Regulated Environment
410.680  Managerial Finance for Biotechnology I
410.681  Commercializing Biotechnology
410.684  Technology Transfer and Commercialization
410.685  Emerging Issues in Biotechnology
410.687  Ethical, Legal, and Regulatory Aspects of the Biotechnology Enterprise
410.688  Project Management in Biotechnology
410.689  Leading Change in Biotechnology
410.703  Strategic Planning for the Biotechnology Enterprise
410.704  Social Entrepreneurship in Bioscience
410.728  Managing Innovation in the Life Sciences
410.729  Regulatory and Economic Fundamentals of Drug Pricing and Reimbursement
410.732  Funding a New Venture
410.756  Grants and Federal Funding for Biotechnology Enterprises
410.806  Independent Studies in Biotechnology Enterprise and Entrepreneurship (Open only to students in the MBEE program.)

Concentration in Molecular Targets and Drug Discovery Technologies

This concentration is open to MS in Biotechnology students who meet the standard admission requirements. The fellowship, however, is limited to recent post-baccalaureates who meet both the CCR/NCI Fellowship and MS degree requirements. This concentration is offered only at JHU's Montgomery County Campus in Rockville, Maryland.

Concentration Courses
410.696  Bioassay Development
410.750  Molecular Targets and Cancer
410.751  Chemical Libraries and Diversity
410.752  High Throughput Screening & Automation Lab

Elective Courses
Two required

410.613  Principles of Immunology
410.622  Molecular Basis of Pharmacology
410.633  Introduction to Biinformatics
410.658  Cancer Biology
410.659  Protein Bioinformatics
410.645  Biostatistics
410.652  Cell Culture Techniques
410.663  Current Topics in Molecular and Cellular Biology
410.671  Microarray and Analysis
410.697  Microfluidics and Biosensors

Concentration in Regulatory Affairs
Developed in consultation with representatives from the Food and Drug Administration (FDA), the Regulatory Affairs Professional Society (RAPS) and the biotechnology industry,
this concentration in the Master of Science in Biotechnology provides students with the knowledge and understanding required for companies and organizations to comply with federal and state regulatory statutes for the development, approval and commercialization of drugs, biologics, foods and medical devices.

Students in this concentration must complete four core science courses, four core regulatory affairs courses and two science electives.

**Regulatory Affairs Concentration Courses**

**Choose four**

410.606 Clinical Trial Management
410.627 Translational Biotechnology: From Intellectual Property to Licensing
410.648 Clinical Trial Design and Conduct
410.649 Introduction to Regulatory Affairs
410.651 Clinical Development of Drugs and Biologics
410.673 Biological Processes in Regulatory Affairs
410.675 International Regulatory Affairs
410.676 Food and Drug Law
410.677 Preparing a Successful Submission
410.678 Marketing in a Regulated Environment
410.682 Validation in Biotechnology
410.683 Introduction to cGMP Compliance
410.686 QA/QC for the Pharmaceutical and Biotechnology Industries
410.687 Ethical, Legal, and Regulatory Aspects of the Biotechnology Enterprise
410.690 Technical Writing in a Regulated Environment
410.691 Drugs, Medical Devices, and Government
410.701 Introduction to Food Safety
410.702 Biomedical Software Regulation
410.715 Medical Device Regulation
410.727 Regulatory Strategies in Biopharmaceuticals
410.729 Regulatory and Economic Fundamentals of Drug Pricing and Reimbursement
410.802 Independent Studies in Regulatory Science
410.803 Regulatory Science Thesis

Students may choose any two science electives for which they have met the prerequisites. For a complete list of electives, visit biotechnology.jhu.edu.

**Concentration in Health Science Intensive**

Through this unique post-baccalaureate program, students enroll full-time in an innovative curriculum specifically created to help students build a more competitive medical school application. In addition to the six required courses, students work with their advisor to choose four elective courses that meet their professional goals. Students must also attend at least 80% of an advising seminar series.

**Core Science Courses**

*Core requirements differ for this concentration*

410.601 Biochemistry
410.602 Molecular Biology
410.603 Advanced Cell Biology I

**Core Non-Science Courses**

410.705 Communication for Health Care Professionals
410.706 Building and Leading Teams in Health Care
410.707 The Psychosocial Determinants of Health, Implications on Diagnostics

**Elective Courses**

Below is a potential list of elective courses. Not all courses are available every semester. Contact your advisor for course selection options. Online courses will not be accepted towards required or elective course requirements.

Three required

410.604 Advanced Cell Biology II
410.612 Human Molecular Genetics
410.613 Principles of Immunology
410.614 Pathogenic Bacteriology
410.615 Microbiology
410.616 Virology
410.618 Parasitology
410.620 Advanced Topics in Immunology
410.623 Molecular and Cellular Physiology
410.628 Neurobiology
410.629 Genes and Disease
410.631 Infectious Diseases
410.636 Biology of HIV and AIDS
410.638 Cancer Biology
410.655 Radiation Biology

**ONLINE COURSES**

The Johns Hopkins University (JHU) Advanced Biotechnology Studies Program offers a wide range of online courses that can conveniently fit into your schedule. Designed for busy bioscience professionals, our online courses provide in-depth coverage of theoretical, applied and specialized subjects, and are taught by expert faculty from academia, the private sector and the government.

You may complete the degree requirements completely online for the Master of Science in Biotechnology, Master of Science in Bioinformatics, Master of Biotechnology Enterprise and Entrepreneurship, Master of Science in Food Safety Regulation, Master of Science in Regulatory Science, Certificate in Biotechnology Enterprise, and the Post-Master’s Certificate in Sequence Analysis and Genomics. (Note that not all concentrations for the MS in Biotechnology can be completed online.)

For course descriptions, see page 58.
Johns Hopkins University (JHU) offers a dual degree graduate program that prepares bioscience professionals for success in both the science and business of biotechnology. Drawing from the strengths of the Krieger School of Arts and Sciences and the Carey Business School, this innovative program allows students to earn two advanced degrees in less time than it takes to earn them separately. Students receive two diplomas: one from the Krieger School of Arts and Sciences and one from the Carey Business School. Students may count 3 courses from their MS program toward the Carey 54-credit Professional MBA program and, as a result, complete the MBA with 42 credits of Carey courses.

For more information on the dual degree program at JHU, visit the website at advanced.jhu.edu/biomba or call 202.452.1940.

Applicants must meet the following criteria to be considered, and should review the admissions requirements for the specific biotechnology masters degrees. In addition, students must provide two letters of recommendation and have a minimum of two years of full-time progressive work experience after completion of their undergraduate studies.

Documents Required

> Completed application form: advanced.jhu.edu/admissions
> Non-refundable application fee: $75 US
> Official transcripts from all college studies
> GMAT or GRE recommended for those students who do not hold a degree beyond a baccalaureate
> Current résumé or curriculum vitae
> Two letters of recommendation: advanced.jhu.edu/admissions
> Typed essay (see application form for directions)

International Applicants

Applicants whose native language is not English and who have graduated from a college or university where English is not the language of instruction, must take the TOEFL and achieve a minimum score of 250 on the computer-based, 600 on the paper-based test or 100 on the Internet-based test.

Currently, international applicants to the MS in Biotechnology/MBA Program are not eligible for the I-20 form (certificate of eligibility) needed to obtain an F-1 student visa. In order to qualify for the F-1 visa, a student is required to be enrolled full-time. Full-time status/full course of study is defined at the Carey Business School as enrolled in minimally nine credits each fall and nine credits each spring semester for graduate study. At the present time, the maximum number of credits offered per semester in this degree program is seven or less. Consequently, an F-1 student would not be able to meet their full-time requirements as defined by the US Citizenship and Immigration Services (USCIS) regulations. If an international is interested in obtaining a nonimmigrant visa type other than an F-1 visa, he/she should contact the US embassy in their home country. Students who have visa- or immigration-related questions may contact the International and Disability Services office (IDS) at ids@jhu.edu or 202.452.0983/410.516.1013, option 6.

Course Descriptions

Contact businessbiotech@jhu.edu for the Carey Business School course descriptions.

For MS in Biotechnology course requirements, see page 44.

For MS in Biotechnology course descriptions, see page 58.
For a biotechnology enterprise to be successful, it requires trained professionals who understand science and are also skilled in the complexities of biotechnology commercialization. This program brings together a strong science foundation with biotechnology enterprise and entrepreneurship. The program is intended for biotechnology professionals who seek a career beyond the laboratory, either within an existing biotechnology group or organization, or for those who seek to start a new biotechnology enterprise. The curriculum is designed to prepare the next generation of interdisciplinary professionals to address the enterprise and regulatory challenges organizations face in the biotechnology industry.

Students will complete 10 graduate courses, including a final practicum course to gain real-world experience. Students may choose three electives across a broad range of science, enterprise and regulatory courses, (no more than one elective may be a business course) or they may choose a concentration in Bioscience Communications or Legal/Regulatory Affairs.

Students entering this program will have completed the prerequisite courses in biochemistry and cell biology. Students take seven required core courses, including a practicum. This degree program is designed for full-time working adults and should take approximately two years to complete, although students may accelerate completion of the program if they wish. The entire 10-course curriculum may be completed fully online or a combination of online and onsite. The faculty members teaching the program are all leaders in the field of regulatory sciences. They work in industry for both private, biomedical science organizations and the federal government, including the Food and Drug Administration (FDA).

Important notice for international students regarding visa requirements: While the program may be completed online or by a combination of online and onsite, the degree may not be completed fully onsite.

ADMISSION REQUIREMENTS

> One semester of Biochemistry and Cell Biology at the undergraduate or graduate level or 410.303 Foundations of Bioscience
> An undergraduate degree in the life sciences or engineering from a four-year College with at least a 3.0 on a 4.0 scale
> Application documents
> Current résumé

> 500-word statement of purpose
> Official transcripts

The Admissions Committee reserves the right to request additional information from applicants, if needed, to assess their candidacy for admission.

DEGREE REQUIREMENTS

| Core courses | Six |
| Practicum | One |
| Electives | Three |

Choose three electives from the Advanced Biotechnology Studies Program for which you have met the prerequisites or have received permission from the program committee. See Course Descriptions in the MS in Biotechnology for a list of courses.

410.303 Foundations of Bioscience
Prerequisite for provisional students accepted in the program who have not previously taken biochemistry or cell biology
Required Courses

410.607  Proseminar in Biotechnology
410.627  Translational Biotechnology: From Intellectual Property to Licensing
410.643  Managing and Leading Biotechnology Professionals
OR
410.689  Leading Change in Biotechnology
410.644  Marketing Aspects of Biotechnology
410.687  Ethical, Legal and Regulatory Aspects of the Biotechnology Enterprise
410.804  Practicum in Biotechnology Enterprise and Entrepreneurship

MASTER OF BIOTECHNOLOGY ENTERPRISE AND ENTREPRENEURSHIP CONCENTRATION (OPTIONAL)

Students wishing to focus on a specialized discipline within the Master’s in Biotechnology Enterprise and Entrepreneurship Program may enroll in one of two concentrations: Bioscience Communications or MBEE Legal/Regulatory Affairs.

Concentration in MBEE Legal/Regulatory Affairs

In addition to the six core courses and practicum, degree candidates must complete any three of these courses to satisfy the MBEE Legal/Regulatory Affairs concentration requirements:

410.606  Clinical Trial Management
410.648  Clinical Trial Design and Conduct
410.650  Legal Aspects of Biotechnology
410.651  Clinical Development of Drugs and Biologics
410.673  Biological Processes in Regulatory Affairs
410.676  Food and Drug Law
410.683  Introduction to cGMP Compliance
410.684  Technology Transfer & Commercialization

For course descriptions, see page 58.
Master of Science in Food Safety Regulation
advanced.jhu.edu/foodsafety

The new Master of Science in Food Safety Regulation is designed to provide students with an understanding of the legal and regulatory complexities of food production, labeling, and distribution. The program will provide students with the knowledge required for companies and organizations that grow, process, distribute, or sell foods and beverages while complying with federal and state regulatory statutes for the production, distribution, and commercialization of food products. Students will complete 10 graduate level courses within a five year timeline.

On completion of the Master of Food Science in Food Safety Regulation, you will be able to do the following:

- Demonstrate a mastery of technical and critical thinking skills in food safety regulation submissions and statutes
- Design, develop, and implement food safety regulatory submissions
- Analyze and evaluate food safety regulatory statutes, regulations, guidance documents and submissions.

The curriculum offers hands-on, real life food safety regulatory experience through case-studies and other assignments. Students will research, evaluate, and present scientifically and legally-justifiable positions on case-studies from different perspectives of advanced regulatory topics.

Designed for Working Adults
The MS in Food Safety Regulation program offers all courses conveniently online. Most of your highly interactive coursework consists of courses taught by professionals in the field of food safety, from FDA and the food industry. You have up to five years to complete the degree, which typically takes working students between two and three years to complete.

ADMISSION REQUIREMENTS

- One semester of Biochemistry AND one semester of Organic Chemistry at the undergraduate or graduate level OR 410.303 Foundations of Bioscience (available to students admitted provisionally only)
- An undergraduate degree in the life sciences or engineering from a four-year college with at least a 3.0 on a 4.0 scale in the latter half of undergraduate studies
- Application documents
- Current résumé
- 500-word statement of purpose
- Official transcripts

The Admissions Committee reserves the right to request additional information from applicants, if needed, to assess their candidacy for admission.

DEGREE REQUIREMENTS

<table>
<thead>
<tr>
<th>Core courses</th>
<th>Seven</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electives</td>
<td>Three</td>
</tr>
</tbody>
</table>

The three electives can be chosen from any of the Advanced Biotechnology Studies courses for which you have met the prerequisites or have received permission from the program committee.

410.303 Foundations of Bioscience
Prerequisite for provisional students accepted in program who have not previously taken biochemistry or cell biology
The landscape of food safety regulation is currently undergoing extensive changes. As the field continues to change, the proposed program is designed to change with it. While the seven required courses will remain constant, the content will adapt to new discoveries and changes in understanding of the covered topics. Similarly, the approved list of elective courses will be a living document that will include newly created courses as appropriate. Furthermore, new courses will be considered based on student feedback and changes in the industry. In addition, students may request course substitutes from other JHU courses that are appropriate and for which they are qualified.

**REQUIRED COURSES**

410.701 Introduction to Food Safety Regulation  
410.674 Food Microbiology  
410.686 Regulation of Good Food Production Practices  
410.700 Food Labeling and Packaging Regulation  
410.716 Food Toxicology  
410.717 Risk Assessment and Management  
410.718 Food Safety Audits and Surveillance

**SAMPLE ELECTIVE COURSES**

410.621 Agricultural Biotechnology  
410.645 Biostatistics  
410.649 Introduction to Regulatory Affairs  
410.665 Bioscience Communication  
410.675 International Regulatory Affairs  
410.676 Food and Drug Law

For course descriptions, see page 58.
Master of Science in Regulatory Science

regulatory.jhu.edu

As the biomedical industry continues to grow, more companies are developing and commercializing new products. There are thousands of biomedical products in the development pipeline that require regulatory oversight. Many of the companies providing reagents and supplies to the industry must also provide stringent quality controls to ensure compliance with the Food and Drug Administration’s (FDA) current Good Manufacturing Practices (cGMPs) and Quality Systems Regulations (QSRs). These companies will continue to require trained and educated staffing in regulatory science.

Students entering this program will have completed the prerequisite courses in biochemistry and cell biology, and must undertake six required core regulatory courses. Students then may specialize in an aspect of regulatory science of their choice through three elective courses, including advanced regulatory and science courses. Our students receive practical hands-on, real life regulatory science experience through case study assignments and a unique Practicum course at the end of the program, which distinguishes this program as a leader in graduate, regulatory science education. Students completing this regulatory science program are expected to become regulatory science leaders in government and industry.

This degree program is designed for full-time working adults and should take approximately two years to complete, although students may accelerate completion of the program if they wish. The entire 10-course curriculum may be completed fully online or by combining online classes with instruction on-site in the classroom. The faculty members teaching the program are all leaders in the field of regulatory sciences. They work in industry for both private biomedical science organizations and the federal government, including the FDA.

NOTE: The MS in Regulatory Science program is almost completely ONLINE - we typically only run one or two onsite courses PER YEAR. Therefore, it is not possible to comply with student VISA requirements for onsite course loads in the MS in Regulatory Science program. It is recommended that the student stay in their country of origin and take the MS in Regulatory Science degree program completely online to avoid student VISA compliance issues.

ADMISSION REQUIREMENTS

> One semester of Biochemistry and one semester of Cell Biology at the undergraduate or graduate level
> An undergraduate degree in the life sciences or engineering from a four-year college with a GPA of at least a 3.0 on a 4.0 scale
> Application documents
> Current résumé

DEGREE REQUIREMENTS

Core courses Six
Practicum One
Electives Three

The three electives can be chosen from any of the Advanced Biotechnology Studies courses for which you have met the prerequisites or have received permission from the program committee.

410.303 Foundations of Bioscience
Prerequisite for provisional students accepted in program who have not previously taken biochemistry or cell biology
REQUIRED COURSES

410.627 Translational Biotechnology: From Intellectual Property to Licensing
410.649 Introduction to Regulatory Affairs
410.651 Clinical Development of Drugs and Biologics
410.673 Biological Processes in Regulatory Affairs
410.676 Food and Drug Law
410.679 Practicum in Regulatory Science
410.683 Introduction to cGMP Compliance

For course descriptions, see page 58.
Certificate in Biotechnology Education

The Certificate in Biotechnology Education incorporates the fundamental and emerging ideas in biology and biotechnology, as well as issues related to teaching and learning of bioscience at the middle and high school levels. Middle and secondary teachers, as well as curriculum and instructional leaders, will strengthen their own content knowledge and pedagogic techniques in bioscience, and develop ways to teach bioscience effectively in their classrooms. This Certificate consists of five graduate-level courses. The Independent Research Project course will emphasize inquiry-oriented approaches and integrating technology in bioscience education. Moreover, teachers will analyze recent research on bioscience education, reflect on their learning and practice, and develop teaching tools and assessment strategies to engage students in bioscience-related problems and inquiries.

Students who complete the Certificate in Biotechnology Education are eligible to count three science course credits toward a Master of Science in Biotechnology in Krieger School of Arts and Sciences Advanced Academic Programs. For more information, please contact biotechnology@jhu.edu.

For more information about the certificate or how to apply, contact the Center for Biotechnology Education at 410-516-7769 or biotechnology@jhu.edu.

Required Courses

410.303 Foundations of Bioscience
410.601 Biochemistry
410.602 Molecular Biology
410.800 Independent Research Project in Biotechnology

At least one laboratory course*

410.652 Cell Culture Techniques
410.656 Recombinant DNA Laboratory
410.658 Biodefense and Infectious Disease Laboratory Methods
410.660 Immunological Techniques in Biotechnology

*Students must enroll in one laboratory courses offered at the Homewood or Montgomery County campuses. Laboratory courses are not offered online.

For course descriptions, see page 58.
Certificate in Biotechnology Enterprise

Students who want a solid understanding of the biotechnology enterprise and are well-versed in the scientific aspects can apply to the certificate program in Biotechnology Enterprise.

A bachelor’s degree is required, and a degree in the life sciences is recommended. For consideration, students submit the standard application form and official transcripts. A grade point average of 3.0 on a 4.0 scale is expected.

Certificate requirements consist of five courses chosen from the list below. Students may take either two or three of the required courses listed below and then complete two to three of the elective courses listed below for a total of five courses. (While most courses have no science prerequisites, students should not enroll in 410.627 Translational Biotechnology: From Intellectual Property to Licensing or 410.651 Clinical Development of Drugs and Biologics unless they have a strong background in molecular biology, or have taken the core courses 410.601 Biochemistry and 410.602 Molecular Biology.)

Students who successfully complete the certificate and subsequently decide to seek admission to the master’s degree program in biotechnology will receive credit for three of the courses taken in the certificate. All time limit restrictions as noted in the admissions section of this catalog will apply.

Required Courses

Pick two to three of the following

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.643</td>
<td>Managing and Leading Biotechnology Professionals</td>
</tr>
<tr>
<td>410.644</td>
<td>Marketing Aspects of Biotechnology</td>
</tr>
</tbody>
</table>

Electives

Pick two to three of the following for a total of five courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.607</td>
<td>Proseminar in Biotechnology</td>
</tr>
<tr>
<td>410.627</td>
<td>Translational Biotechnology: From Intellectual Property to Licensing*</td>
</tr>
<tr>
<td>410.637</td>
<td>Bioethics</td>
</tr>
<tr>
<td>410.642</td>
<td>Economic Dynamics of Change in Biotechnology</td>
</tr>
<tr>
<td>410.645</td>
<td>Biostatistics*</td>
</tr>
<tr>
<td>410.646</td>
<td>Creating a Biotechnology Enterprise</td>
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<tr>
<td>410.647</td>
<td>Research Ethics</td>
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<tr>
<td>410.649</td>
<td>Introduction to Regulatory Affairs</td>
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<tr>
<td>410.650</td>
<td>Legal Aspects of Biotechnology</td>
</tr>
<tr>
<td>410.651</td>
<td>Clinical Development of Drugs and Biologics*</td>
</tr>
<tr>
<td>410.665</td>
<td>Bioscience Communication</td>
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<tr>
<td>410.678</td>
<td>Marketing in a Regulated Environment</td>
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<tr>
<td>410.681</td>
<td>Commercializing Biotechnology</td>
</tr>
<tr>
<td>410.683</td>
<td>Introduction to cGMP Compliance</td>
</tr>
<tr>
<td>410.684</td>
<td>Technology Transfer and Commercialization</td>
</tr>
<tr>
<td>410.685</td>
<td>Emerging Issues in Biotechnology</td>
</tr>
<tr>
<td>410.687</td>
<td>Ethical, Legal &amp; Regulatory Aspects of the Biotechnology Enterprise</td>
</tr>
<tr>
<td>410.688</td>
<td>Project Management in Biotechnology</td>
</tr>
<tr>
<td>410.689</td>
<td>Leading Change in Biotechnology</td>
</tr>
<tr>
<td>410.703</td>
<td>Strategic Planning for the Biotechnology Enterprise</td>
</tr>
<tr>
<td>410.704</td>
<td>Social Entrepreneurship in Bioscience</td>
</tr>
<tr>
<td>410.728</td>
<td>Managing Innovation in the Life Sciences</td>
</tr>
<tr>
<td>410.729</td>
<td>Regulatory and Economic Fundamentals of Drug Pricing and Reimbursement</td>
</tr>
<tr>
<td>410.732</td>
<td>Funding a New Venture</td>
</tr>
<tr>
<td>410.756</td>
<td>Grants and Federal Funding for Biotechnology Enterprises</td>
</tr>
</tbody>
</table>

Note: This list is subject to change. Please contact the program director to determine if an elective will count towards the certificate.

For course descriptions, see page 58.

* Also counts as science elective.
Post-Master’s Certificate in Sequence Analysis and Genomics

The field of bioinformatics is continually expanding and challenging our ability to bridge the gap between molecular biology and computer technology. Specifically, the revolution in sequencing technology has resulted in vast quantities of data that require storage and analysis. The analysis of nucleic acid and protein data requires specialized bioinformatics tools and an understanding of genomics. The emerging sequencing technologies and accompanying bioinformatics tools will advance personalized medicine, pharmacogenomics and molecular diagnostics methods. The advancement of these tools will open new avenues of research on many fronts.

This new certificate is targeted at scientists who already have grounding in biochemistry, molecular biology and cell biology and do not need advanced computer skills; thus, they do not require all the core requirements of the other two master's programs. It introduces students to the foundations of bioinformatics through the core bioinformatics courses and then the students take upper level courses that are required for understanding and performing sequence and genomic analysis. The program is offered both online and onsite.

Required Courses
- 410.633 Introduction to Bioinformatics
- 410.634 Practical Computer Concepts for Bioinformatics
- 410.666 Next Generation Sequencing and Analysis

Elective courses
Choose two
- 410.635 Bioinformatics: Tools for Genomic Analysis
- 410.639 Protein Bioinformatics
- 410.640 Molecular Phylogenetic Techniques
- 410.645 Biostatistics
- 410.671 Microarrays & Analysis
- 410.712 Advanced Practical Computer Concepts for Bioinformatics
- 410.713 Advanced Genomics and Genetic Analysis
- 410.734 Practical Introduction to Metagenomics
- 410.736 Genomic and Personalized Medicine

For course descriptions, see page 58.

Admission Requirements

> Master's or doctoral degree in the biological sciences or engineering from an accredited institution
> One semester of Biochemistry or equivalent or 410.601
> One semester of Molecular Biology or equivalent or 410.602
Biotechnology Studies Course Descriptions

Bioinformatics, Biotechnology, Biotechnology Enterprise & Entrepreneurship, Food Safety Regulation, Regulatory Science, Biotechnology Education, Biotechnology Enterprise, Sequence Analysis and Genomics

Below is a cumulative list of course descriptions for the degree and certificate programs (listed above) of The Center for Biotechnology Education. Note that the categories in which a course is listed below may not reflect the categories in which a course is listed in a specific program. For course requirements for a specific program, consult the individual program's pages in this catalog.

PREREQUISITE COURSES

410.302  Bio-Organic Chemistry
This course provides a foundation in structural organic chemistry, acid base chemistry, chemical thermodynamics, and reaction mechanisms. Subjects include Lewis structures, atomic and hybridized orbitals, stereochemistry, inter- and intramolecular forces of attraction, nucleophilic reaction mechanisms, functional groups, and the organic chemistry of biological molecules. Please note that this course does not count toward requirements for the master's degree in biotechnology. Prerequisite: Two semesters of college chemistry.

410.303  Foundations in Bioscience
This course examines the fundamental underlying scientific concepts utilized in the creation and development of biomedical products. Topics to be covered include the structure and function of biomolecules such as proteins, enzymes, carbohydrates, lipids, and DNA, as well as the structure and function of cellular components such as membranes, vesicles, organelles, and the cytoskeleton. In addition, students will examine the complexities of metabolism, DNA replication, transcription, translation, signal transduction mechanisms, apoptosis, the cell cycle, and cancer. Please note that this course does not count toward requirements for the master's degree in biotechnology. Prerequisite: Two semesters of college chemistry.

CORE COURSES

410.601  Biochemistry
This course explores the roles of essential biological molecules focusing on protein chemistry, while covering lipids and carbohydrates. It provides a systematic and methodical application of general and organic chemistry principles. Students examine the structure of proteins, their function, their binding to other molecules and the methodologies for the purification and characterization of proteins. Enzymes and their kinetics and mechanisms are covered in detail. Metabolic pathways are examined from thermodynamic and regulatory perspectives. This course provides the linkage between the inanimate world of chemistry and the living world of biology.

410.602  Molecular Biology
This course provides a comprehensive overview of the key concepts in molecular biology. Topics to be covered include nucleic acid structure and function, DNA replication, transcription, translation, chromosome structure and remodeling and regulation of gene expression in prokaryotes and eukaryotes. Extended topics to be covered include methods in recombinant DNA technology, microarrays, and microRNA. Prerequisite: 410.601 Biochemistry

410.603  Advanced Cell Biology I
This course covers cell organization and subcellular structure. Students examine the evolution of the cell, chromosome and plasma membrane structures and behaviors, mechanics of cell division, sites of macromolecular synthesis and processing, transport across cell membranes, cell dynamics, organelle biogenesis, and cell specialization. Students also are introduced to the experimental techniques used in cell biology to study cell growth, manipulation, and evaluation.

410.604  Advanced Cell Biology II
This course is a continuation of 410.603 (Advanced Cell Biology I) and further explores cell organization and subcellular structure. Students examine cell-to-cell signaling that involves hormones and receptors, signal transduction pathways, second messenger molecules, cell adhesion, extracellular matrix, cell cycle, programmed cell death, methylation of DNA and modification of chromatic structure, and mechanisms of the cell. The involvement of abnormalities in signal transduction pathways to oncogenesis and other disease states will be stressed. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology I

ENTERPRISE AND REGULATORY COURSES

410.607  Proseminar in Biotechnology
The Biotechnology Proseminar introduces students to issues and challenges facing leaders of public and private sector organizations, and communities seeking to achieve shared goals within the biotechnology industry. The course brings together diverse academic science and business disciplines (science, regulatory affairs, marketing, finance, legal, ethics, communications, etc.). It explores how these disciplines can be used as powerful tools to create effective leadership, and productive collaborations within the industry, while improving managerial decision making. The Proseminar frames and integrates the combined MS/MBA Biotechnology content, methods, and tools of inquiry and analysis.
410.637 Bioethics
Students in this course analyze and discuss traditional philosophical theories regarding the nature of the moral good. They then apply these theories to critical issues and selected cases involving experiments with human subjects, organ transplantation, in-vitro fertilization, the use of animals in research, the collection and publication of research data, peer review, conflicts of interest, and other topics of current concern.

410.642 Economic Dynamics of Change in Biotechnology
Governments around the world are beginning a long term process that reviews and redesigns its healthcare systems addressing concerns of innovation, cost, equitable access, and sustained quality of healthcare. As a result healthcare is undergoing significant changes globally in R&D, marketing, pricing, sales and distribution. This course helps students to understand these processes and the new business opportunities and new business models they will create. It provides some of the basics of macro-and microeconomics to clarify how economic and social forces drive changes in the pharmaceutical, biotech, and genetic industry. Emphasis will be placed on the application of economics.

410.643 Managing and Leading Biotechnology Professionals
The roles of managers and leaders within biotechnology companies undergo constant change. Biotechnology managers and leaders must engage in new and innovative problem-solving strategies; lead a diverse and global workforce; develop partnerships with other businesses, customers, and competitors; manage horizontally and across teams; and utilize technology as a competitive advantage. The student is able to address current challenges in his/her own organization and learn methods of implementing change, such as negotiation techniques and motivation. The course includes in-depth discussions of leadership skills, communication, conflict resolution, and goal integration. Students research a biotechnology organization and analyze what is working and not working within the management systems and suggest alternatives.

410.644 Marketing Aspects of Biotechnology
This course introduces students to the strategic and tactical approaches used in the marketing of biotechnological products and services. Students gain a thorough understanding of the research and planning necessary to develop a marketing plan, the relationship between the marketing and sales functions, the difference between marketing a scientific product and a scientific service, pricing strategies, distribution alternatives, communications, promotion, and the importance of perception. Knowledge of marketing terminology and techniques prove helpful to anyone in the industry.

410.646 Creating a Biotechnology Enterprise
This course provides a foundation to start or help grow a young biotechnology company from inception through early growth. Topics include market assessment of innovative technology, patents and licensing, corporate law, preparing a business plan, raising money from angels and venture capitalists, government grants, strategic alliances, sales and marketing, real estate, human resources, and regulatory affairs. The course provides a survey and overview of the key tasks and challenges typically faced by biotech entrepreneurs, their management team, and directors. Students will prepare a business plan for a biotech start-up and present the plan to a panel of industry experts and financiers. Leaders from our local bioscience community will be guest lecturers for many of the classes.

410.647 Research Ethics
This course covers the basic ethical notions in the conduct of biomedical research with animals and human subjects and that make up the core values of scientific integrity. Students explore issues central to these areas, such as the appropriate use of animals in research, informed consent for human subjects, authorship, peer review, and the ethics of the business of science.

410.649 Introduction to Regulatory Affairs
Regulatory affairs (RA) comprise the rules and regulations governing product development and post-approval marketing. In the U.S., the FDA establishes and oversees the applicable regulations under several statutes, many regulations, and partnership with legislators, patients, and customers. Biotechnology products may be classified as drugs, biologics, or medical devices. Each type is regulated by a different center within the FDA. This course provides an overview of RA, its effect on product development. Topics include: RA history, regulatory agencies, how to access regulatory information, drug submissions, biologics submissions, medical device submissions, GLP, GCP, GMP, and FDA inspections.

410.650 Legal Aspects of Biotechnology
This course is a survey of legal topics relevant to a biotech enterprise as it is established, conducts research and brings innovative products to market. These include property, contracts, regulatory compliance and patents. Students will be able to analyze common business situations and understand how associated legal risks are managed. Students who have taken 410.687 Ethical, Legal and Regulatory Aspects of the Biotechnology Enterprise will also benefit from this course as they will analyze contracts, patents and various statutes and court decisions that impact the biotechnology sector.

410.665 Bioscience Communication
Researchers must communicate effectively so their discoveries can be shared with others. In this course, students learn how to communicate their ideas to other researchers, their scientific peers, and investment communities. Students must master both written and verbal communication skills; they hone their expertise at making both formal and informal oral presentations; they prepare poster presentations, and develop their own public speaking strategies. The course also presents personal strategies for improving daily communications, cross-cultural communications, and non-verbal skills. Students improve their written communication, editing, and informal writing skills. Participants also learn effective e-mail strategies for getting their message across, and learn how effective writing can improve their chances of getting grant applications approved. Class assignments include preparation of scientific papers, general science writing, oral presentations, PowerPoint presentations, and scientific posters.
410.675 International Regulatory Affairs
The pharmaceutical/biotechnology product approval and marketing requires a good understanding of international regulatory affairs in order to successfully compete in today's global market place. It is important for tomorrow's leaders to understand and follow the regulatory differences to ensure optimum product development strategies, regulatory approvals and designs for exports conforming to the foreign regulatory bodies. There are various product development strategies that industry is using to shorten the product development time by conducting preclinical programs outside the US, however, the strategy requires a careful planning and interaction with the US and foreign regulatory agencies. With the increase in globalization of economy and exports, international regulations will have a bigger impact on the biotechnology business in the future. The course provides a review and analysis of the pharmaceutical/biotechnology product approval processes within the world's major markets. The key strategies required in preclinical product development to marketing approval of the products in Europe, Japan, and the US will be compared and discussed. Students will explore the European Union (EU) regulations and their overall importance on international markets. The course will cover the salient features of common technical and regulatory documents required for submission and approval to the leading regulatory bodies in the world, general guidance documents, International Harmonization, and General Agreement on Tariffs and Trade (GATT).

410.676 Food And Drug Law
The Food, Drug, and Cosmetic Act (FD&C Act) governs the regulatory approval process for bringing a drug, biologic, medical device, food, or cosmetic to market. The class will discuss administrative procedures followed by the FDA. The course includes an overview of the drug, biologic and medical device approval processes and the regulation of food and dietary supplements. Students then will be exposed to the enforcement activities of the FDA, including searches, seizure actions, injunctions, criminal prosecutions, and civil penalties authorized under the FD&C Act, as well as other statutes like the Public Health Service Act (which regulates the development and approval of biologics).

410.677 Preparing a Successful Submission
The federal Food, Drug, and Cosmetic Act (FD&C Act) requires that a drug be the subject of an approved marketing application before it is transported or distributed across state lines. Because a sponsor will likely enter interstate commerce in the preparation or study of the investigational drug, it must seek an exemption from that legal requirement. The Investigational New Drug Application, or IND, is the means by which a sponsor obtains this exemption from the FDA. The New Drug Application, or NDA, is the application which when approved by the FDA, provides the legal basis for marketing a new drug. Beginning with the IND and moving through the NDA this course provides a comprehensive review and discussion of the IND and NDA and all related submissions required for life cycle maintenance of the applications.

410.678 Marketing in a Regulated Environment
This course is designed to help students understand how companies can effectively achieve their marketing goals while complying with the laws, regulations, and policy guidance documents governing marketing, advertising and promotion of products regulated by the Food and Drug Administration (FDA). The course provides an overview of marketing, in a context of FDA regulations. We offer perspectives and real-world discussions of the FDA's advertising and promotion oversight, enforcement responsibilities. The course focuses on types of marketing and promotion activities that are commonly used in the industry for marketing drugs and diagnostics, and we cover strategies and activities that can be effectively incorporated into overall marketing, including reimbursement, pricing, distribution, social media, channel management, and others, using industry current best practices. The course introduces students to advertising guidelines associated with regulated products. It provides insights on effective marketing research approaches, including analysis of current markets, patient profiles, competition, pricing, the value of comparative data, and issues associated with unapproved investigational products, and unapproved research products.

410.679 Practicum in Regulatory Science
This integrative case-based course will focus on applying knowledge gained from previous courses in the MS in Regulatory Science program to actual cases from the U.S. Food and Drug Administration. For each case, students will assume the role of regulatory specialist, an FDA reviewer or senior-level policy-maker, or other involved stakeholders, such as a consumer group or an advocacy group. Students will be expected to research, evaluate, and present scientifically and legally justifiable positions on case studies from the perspective of their assigned roles. Students will present their perspectives to the class and be asked to debate the issues with the other students from the perspective of their assigned roles. The major responsibility of the students in this course will be to make scientifically and legally defensible recommendations and to justify them through oral and written communication. Please note this course is only open to students in the MS in Regulatory Science and should only be taken after all required courses are completed.

410.680 Finance for Biotechnology I
The management of money is a key ingredient for the success of any enterprise, and even more so for the entrepreneur seeking to achieve both translation of an idea to product while concurrently making money for investors. Students will build an understanding of the basics of contemporary global monetary systems and the essentials of financial management. This course will include a means to develop a working knowledge of the critical financial factors for decision makers from the perspectives of key stakeholders. The syllabus is designed to provide students with limited or no background in finance an opportunity to establish a means to understand financial basics and communicate clearly in financial terms when conducting business. This course is uniquely designed to meet the current needs of those leading the global life science industry.
410.681 Commercializing Biotechnology
This advanced course provides an integrated and practical approach to considering the principal areas of concern an entity faces when commercializing biotechnology, from creating or obtaining the technology through partnering with others to further develop and commercialize the technology, and finally selling the business or business line that incorporates that technology. The focus of this course is to highlight key junctures in a biotechnology company’s evolution; help students identify key financial, management, and business issues at those junctures; and present practical alternatives for students to consider to resolve those issues. This course builds upon 410.650 Legal Aspects of Biotechnology and 410.646 Creating a Biotechnology Enterprise, but they are not prerequisites for the course.

410.682 Validation In Biotechnology
Understanding validation and applying a comprehensive validation philosophy are essential in today’s biotechnology industry. First and foremost, validation allows a company to operate in compliance with the regulations and guidance set forth by FDA. Perhaps more importantly, it results in equipment, assays, and processes that are well understood and robust, less prone to failure, and more cost-effective. This course will introduce the fundamentals of validation, validation master planning, resource management, types of validation and the associated documentation, departmental roles and interaction, and the differences between commissioning and validation. Students will have an opportunity to solve real-world problems, generate actual validation documents, and develop validation program elements that balance regulatory requirements, operational needs, and business expectations.

410.683 Introduction to cGMP Compliance
Current Good Manufacturing Practice regulations are the minimum standards for the design, production, and distribution of drugs, biologics and medical devices in the U.S. and internationally. In the U.S., they are codified at the federal level, in the FD&C Act and the CFR, and actively enforced by FDA. These regulations, however, only begin to describe the practices used in the pharmaceutical and biotech industries. Additional sources of insight and guidance include FDA’s guidance documents and training manuals, industry trade publications, international compendia, and standards-setting organizations. Students will learn the scope and history of the regulations, industry-standard implementation strategies and “best-practices” approaches, and FDAs current expectations. Students will also learn to apply practical solutions to the regulatory issues faced in the pharmaceutical and biotech industries today.

410.684 Technology Transfer & Commercialization
This course is an introduction to the multidisciplinary aspects involved in the process of translating innovations in technology into commercial use, particularly research discoveries emanating from universities and other nonprofit organizations. The course will provide an overview of the key policies, concepts, tools, issues, practices, and trends that are shaping the technology transfer field, with an emphasis on the life sciences sector.

410.685 Emerging Issues in Biotechnology
Biotechnology impacts the world and our social, political, and physical environment in ways many both inside and outside the industry may not fully understand or appreciate. It is critical to ensure that advances in biotechnology be accompanied by important public, political, and social considerations and discussions. This course will cover issues including domestic and global public perception of biotechnology, its benefits and risks, advances in bioagriculture and genetically modified foods, the impact of recombinant therapeutics on the pharmaceutical and healthcare industry, ways in which advances in biotechnology have and will continue to change our views of what life is, and how the political climate impacts advances in biotechnology discoveries. This highly interactive course will include thought-provoking debate and discussion with industry leaders, both proponents and opponents of biotechnology.

410.686 QA/QC for the Pharmaceutical and Biotechnology Industries
Many new quality initiatives for drugs, biotech products, and medical devices recently have been introduced. These include risk-based, science-based and systems-based assessments. Students will be presented with a comprehensive overview of the current best practices in quality assurance and quality control. Students will also be exposed to the most recent theories and expectations from the Food and Drug Administration.

410.687 Ethical, Legal & Regulatory Aspects of the Biotechnology Enterprise
This course provides an overview of the important ethical, legal and regulatory issues that are critical to the biotechnology industry. The course shares current trends and essential elements of ethics, legal issues and regulations in a way that allows for an appreciation of how each influences the others. Students will examine core ethical values that guide the practice of science in the biotechnology industry. The course will provide an overview of legal issues such as protecting inventions and intellectual property and licensing, and the range of regulatory oversight mechanisms with which the biotech industry must comply. This course will review the implications of strategic ethical, legal and regulatory choices that add value to the biotechnology firm, customers and society.

410.688 Project Management in Biotechnology
Today, many organizations use the approach called “Project Management” to handle activities that have a limited life span, as opposed to routine, ongoing operations. This course will answer the question “What do I do to be successful?” The units will provide guidance for project management success by considering each phase in the life of a typical project, from concept to closeout. We will discuss the nature of project management, the structure of projects, working with teams of technical experts, and all the other activities that make project management different from any other discipline. The course will rely heavily on group discussions. Topics will include deciding what to do, developing a project plan, risk management, team leadership, monitoring and controlling during the project, scope change control, and traditional and modern approaches to project closeout. Concepts presented will be consistent with the Project Management Institute’s “Guide to
the Project Management Body of Knowledge®, the U.S. standard for project management.

410.689 Leading Change In Biotechnology
As bioscience companies grow and mature, leadership needs evolve. Students will learn how to identify their company’s position in the “Leadership Life Cycle” and learn how to select the right leadership capabilities based on their current organizational needs. Research shows that the right leaders at the right time dramatically improve organizational success. Discussions will address the leadership needs of organizations from early stage research-based companies through fully integrated bio-pharmaceuticals. General leadership practices and strategies, moving ideas from research bench to the consumer, and strategies to prevent failure will all be discussed.

410.690 Technical Writing in a Regulated Environment
In this practical course, students will learn both the basic concepts and the steps involved in writing documents and reports commonly associated with compliance and regulatory requirements in the Biotech and Pharmaceutical industries. Through course lectures and interactive exercises, students will learn how to write and revise clear, instructive and readable regulatory documents, policies and reports. This course will cover what to write, how to write, and why documents should be written in certain terms to assure successful communication as well as compliance in a regulated environment.

410.691 Drugs, Medical Devices, and Government
In bringing a food, drug, or medical device to market, Patent Office activities and Food and Drug Administration activities will come into play. The course will explore the administrative roles of each agency and those instances where an intersection or overlap of activities of the agencies occurs. For example, the patentability requirements of utility and enablement of therapeutic methods can depend on the onset of clinical trials. A major nexus occurs in the regulatory approval of a generic form of a patented ethical or “name brand” drug. The patent holder can have the term of the patent extended as compensation for the often prolonged time to obtain regulatory approval. Thus, the patent term is extended beyond the 17-year or 20-year term. Conversely, the generic manufacturer can enter the regulatory process before the patent term expires. Thus, the generic manufacturer legally can make and use the patented invention of another. That is an excused infringement. The earliest generic manufacturer that files an ANDA also may be granted a monopoly period for exclusive sale. The practical aspects associated with the interplay of those two activities will be explored as will the ethical and public policy issues raised by the two activities.

410.701 Introduction to Food Safety
This course is designed to understand the legal and regulatory complexities of the regulation of food products in the United States. The prone issues including regulatory compliance in food safety and Hazard analysis and Critical Control points (HACCP) are among major issues to control the food supply. The Food and Drug Administration (FDA) and the US Department of Agriculture (USDA) have primary responsibility for safety of meat and food products. Based on the principles of HACCP, FDA issued seafood regulations effective in Dec. 1997. However, the regulation of food additives, labeling, dietary supplements, genetic modifications (GM) and the protection of the food supply will provide the in-depth of food regulation in the United States. The FDA and USDA regulate the safe practice of primary and secondary food products to the American public. Depending upon the source and nature of food product, the method of shipment, advertisement of nutritional values etc. are being governed by FDA and USDA’s jurisdictions. The Food safety Modernization Act overhauls the FDA in food surveillance, enforcing regulations on specific targets, inspections records examination, and exemptions. In this course students will learn the existing food regulations and safety net by examining the product tracing, performance standards and preventive control plans towards food safety, security, genetic modifications, dietary supplements, and food labeling etc. Students will have option to design projects to propose effective food safety net that can assist in the supply chain of nation’s food safety and security.

410.702 Biomedical Software Regulation
Software continually grows more complex and is becoming relied upon by healthcare professionals in the treatment of patients. This course describes how the U.S. government regulates software used in delivering healthcare including the regulations utilized by the Food and Drug Administration (FDA), as well as, the Center for Medicare and Medicaid Services (CMS). This course covers a wide range of topics, including: FDA regulation of software as a medical device and software validation, medical imaging software regulation, electronic recordkeeping and software used in clinical trials, laboratory information management systems (LIMS), and HIPAA privacy rules and security standards.

410.703 Strategic Planning for the Biotechnology Enterprise
This course is an overview of the strategic planning process os a biotechnology enterprise. It focuses on creating value through strategy formulation and implementation. Topics covered include leadership and technology competencies, performance indicators, intellectual property, corporate governance, regulatory strategy and appropriating value. The thesis of the course is that effective strategic planning and implementation is critical to success, and that is provides a valuable, structured process to create enterprise value and to manage business risks. Best practices in strategic planning and managing the planning process also are provided.

410.704 Social Entrepreneurship in BioScience
This course will explore how biotechnology innovators are solving social issues including developing medical diagnostics, discovering effective and safer medicine, producing cleaner energy, remediating environmental contamination and improving crop yields. Students will think broadly in terms of roles required in tackling these social, economic, health and environmental issues and how they can add value to society. This course will cover social entrepreneurship principles and practices in a range of sectors including corporate social responsibility and public value missions in emerging markets. Students will have opportunities to define their
role in advancing biotechnology as it relates to the top global challenges.

410.715 Medical Device Regulation
This course provides a comprehensive introduction into medical devices and how they are regulated by the US Food and Drug Administration (FDA). Topics that will be covered include: (1) an overview of the laws and regulations that govern medical devices; (2) FDA's organizational structure and responsibilities for medical device regulation; and (3) administrative and legal requirements for medical devices throughout the full product life-cycle. Particular focus will be placed on the premarket review, postmarket programs enforcement (e.g., Quality System regulation, and FDA inspectional programs). Included will be discussions on the responsible offices and major program requirements and resources. Students will be given various case studies to examine the application of regulations, as well as, participate in a 510(k)/PMA workshop, mock inspectional audit, and a mock enforcement action. Upon completion of this course, the student will have a working knowledge of the requirements and policies of FDA regulation of medical devices.

410.727 Regulatory Strategies in Biopharmaceuticals
Given the costly drug-development process and the limited resources of emerging biopharmaceutical companies, developing an early regulatory strategy—starting well before clinical trials are initiated—is extremely important for the success of a company. This course will discuss different regulatory strategies that several players of the US biopharmaceutical industry have employed. Students will learn about interacting with regulatory agencies, the orphan drug development, accelerated approval, fast track, priority review, and other regulatory mechanisms, pharmacogenomics and biomarkers, adaptive clinical trials, animal rule, generic drug development and biosimilars. Using case studies, the impact of these regulatory strategies on drug development and how these strategies have helped many biopharmaceutical companies will be discussed. At the end of this course, students will better understand federal regulations and the aspects involved in developing efficient regulatory strategies.

410.728 Managing Innovation in the Life Sciences
Innovation is the creation of value from new ideas, concepts, methods, materials, and organizational structures. Life Sciences organizations that seek to create value for their stakeholders must do so using available capital resources: financial capital, human capital, intellectual capital and physical capital. They should manage those resources to gain leverage and maximize value realized. They then seek to defend and control the value created. Why then, do most organizations treat innovation (and innovators) in ways similar to the body’s immune system (i.e., by identifying the innovators, isolating them, “killing” them, and ejecting them from the organization)? This course will explore innovation, invention, and value creation as a driving force in the biotechnology or life sciences enterprise and the ways in which managers should plan to take full advantage of innovation as the only true competitive weapon for long term success. A special emphasis will be placed on innovation as applied to life science applications (biotechnology, medical devices, health care delivery, drug discovery, development and packaging, bioinformatics, etc.). Topics include invention, ROI, disruption, creative destruction, types of innovation, technology brokering, organizational structures that foster innovation, planning and managing for innovation. Students are required to read extensively, participate actively in discussions, do case studies, and develop a convincing pitch for an innovation project.

410.729 Regulatory & Economic Fundamentals of Drug Pricing & Reimbursement
The US government is now the single largest purchaser of drugs in the world. As the realities of the economic crisis and long term health care reform take root, pricing of pharmaceutical products and the reimbursement regulations that attach to drugs will shape research and development for years to come. As regulatory hurdles continue to climb, the burden of proof will increasingly continue to be on the pharmaceutical industry to prove the value of an individual pharmaceutical product. This course will examine the elements of pharmaceutical pricing and reimbursement to better understand accepted drug pricing models, and how both government and industry look at drug pricing and reimbursement. This will include cost-efficiency modeling of the drug development and manufacturing process, therapeutic cost utility and cost benefit analysis, US and international pharmaceutical product registration, accepted methods for valuing pharmaceuticals, macro- and microeconomic analysis and drug development decision modeling as part of a framework for health care economic evaluation, and the political and ethical underpinnings of health care reform as it reflects on the need for government and society to define the fundaments of drug pricing and reimbursement. The goal will be to provide the framework for the pharmaceutical industry professional to better understand the regulatory and economic fundamentals of drug pricing and reimbursement.

410.732 Funding a New Venture
In this course we study the nuts and bolts of putting together a new company and explore financial markets and the economics of life science companies. The course includes weekly discussions based upon textbook and outside reading materials; the latter are often topical and speak to the issues of the day, and how they may affect investor's confidence and funding. Video presentations on the part of all students are required. We will examine the roles of corporate officers and the venture community. The students will learn what makes the startup process both attractive and difficult, and will work through that process in a realistic manner.

410.756 Grants and Federal Funding for Biotechnology Enterprises
This course is designed to help students working for life sciences companies understand the fundamentals of obtaining government funding for product/technology research and development. While the emphasis will be on grant funding from the National Institutes of Health, other Federal and state funding mechanisms will also be covered. Students will learn how to search for funding opportunities and receive an overview of the NIH funding mechanisms as well as background and history of the Small Business Innovation Research (SBIR) program. The course will provide insights on preparing an SBIR proposal and
submission procedure. Fundamentals of government contracting law will also be covered.

**410.799 Current Topics in Regulatory Policy**
The ability to successfully navigate the intersections of law, regulation, guidance, and policy has never been more critical to the success of entities engaged in the medical product development and commercial marketing. The entities that make up this industry are very sophisticated in their abilities to innovate at a blazing speed. In contrast, regulators must use a regulatory model that evolves and adapts much slower than their industry counterparts. As a result, regulators are relying more heavily on policy to drive their strategy, actions, and outcomes. Therefore, a clear understanding of regulatory policy is an essential consideration for individuals engaged in the medical product development industry. This course provides an introduction into several key areas of government regulatory policy (both old and new) and regulatory science. The topics covered in this course will serve as a road map for students who want to successfully navigate within this complex and changing regulatory model.

**410.802 Independent Studies in Regulatory Science**
Students in the regulatory science program have the opportunity to enroll in an independent study course. This elective course is an option after a student has completed at least five graduate-level courses and has compiled a strong academic record. Prior to proposing a project, interested students must have identified a study topic and a mentor who is familiar with their prospective inquiry and who is willing to provide guidance and oversee the project. The study project must be independent of current work-related responsibilities as determined by the project mentor. The mentor may be a faculty member teaching in the regulatory science program, a supervisor from the student's place of work, or any expert with appropriate credentials. The goal of the study project should be a "publishable" article. Students are required to submit a formal proposal for review and approval by the regulatory science program committee. The proposal must be received by the Advanced Academic Programs office no later than one month prior to the beginning of the term in which the student wants to enroll in the course. Students must meet with a member of the program committee periodically for discussion of the project's progress, and a written document must be completed and approved by the program committee and project mentor for the student to receive graduate credit. Additional guidelines can be obtained from the AAP administrative office. This course is open only to students in the MS in Regulatory Science program or the MS in Biotechnology with a concentration in Regulatory Affairs and may be taken only after 5 courses have been completed.

**410.803 Regulatory Science Thesis**
Students wishing to complete a thesis may do so by embarking on a two semester thesis project, which includes 410.802 Independent Studies in Regulatory Science Project and 410.803 Biotechnology Thesis courses. This project must be either a hypothesis-based or research question-based original research study. The student must complete 410.802 Independent Research Project and fulfill the requirements of that course, including submission of project proposal, final paper and poster presentation, before enrolling in the subsequent thesis course. For the thesis course, students are required to submit a revised proposal (an update of the 410.802 proposal) for review and approval by the faculty advisor and biotechnology program committee one month prior to the beginning of the term. Students must meet the faculty advisor periodically for discussion of the project's progress. Graduation with a thesis is subject to approval by the thesis committee and program committee, and requires the student to present their project to a faculty committee both orally and in writing. Prerequisites: All required Regulatory Science courses and three elective courses, which must include 410.802 Independent Studies in Regulatory Science and if hypothesis driven, 410.645 Biostatistics.

**410.804 Practicum in Biotechnology Enterprise & Entrepreneurship**
This course synthesizes the knowledge and skills acquired in the Masters in Biotechnology Enterprise and Entrepreneurship program, while offering a real world examination of a bioscience organization and the issues it faces. Students will form interdisciplinary teams and work with faculty and industry professionals on an authentic and current project from a local bioscience public or private company, an entrepreneurial start-up, or a nonprofit organization. This course is only open to students completing the Masters in Biotechnology Enterprise and Entrepreneurship program.

**410.805 Practicum in Project Management**
This course synthesizes the knowledge and skills acquired in the Certificate in Biotechnology Enterprise Project Management Focus. It offers students a real world examination of a bioscience organization as it develops and implements project management solutions and addresses related problems and issues. Students will work with faculty and industrial professionals on an authentic and current project from a local bioscience public or private company, an entrepreneurial start-up, or a nonprofit organization. This course is only open to students completing the Certificate in Biotechnology Enterprise, Project Management Focus.

**410.806 Independent Studies in Biotechnology Enterprise and Entrepreneurship**
Independent Studies in Biotechnology Enterprise and Entrepreneurship provides students an opportunity to apply knowledge gained from previous courses in a real world situation. Prior to proposing a project, interested students must have identified a study topic, and a mentor (or work with the program committee to identify a project and a mentor) who is familiar with their prospective inquiry and who is willing to provide guidance and oversee the project. The study project must be independent of current work-related responsibilities as determined by the project mentor. The project can be at your work but must be outside your normal course of duties. The mentor may be a faculty member teaching in the enterprise program, a supervisor from the student's place of work, or any expert with appropriate credentials. Students are required to submit a formal proposal for review and approval by the enterprise and entrepreneurship program committee. The proposal must be received by the Advanced Academic Programs office no later than one month prior to the beginning of
HEALTH SCIENCE INTENSIVE COURSES

410.705 Communication for Health Care Professionals
In this course, students will practice both oral and written communication techniques and learn how to effectively communicate in formal and informal arenas. Students will work together to improve daily communications with peers, colleagues and potential patients. Coursework will focus on specific oral competencies including interviewing and being interviewed and cross-cultural communications as well as specific written competencies including application essays, email communications and interview summaries. In all communications, emphasis will be given to getting their message across through logical and concise writing techniques. Additionally, students will discuss how communication strategies can be used to encourage or hinder changes in patient behavior and incite changes in public health.

410.706 Building and Leading Teams in Health Care
In order to provide the best care possible, health care professionals are working together more now than ever before. As a result, strong leadership and teamwork skills are becoming a necessity in joining the health care field. This course will provide hands-on activities to help students develop problem solving skills, learn basic negotiation and mediation strategies, and understand their own tendencies as a leader and team member. Using real world examples, students will explore how strong leadership and teamwork can drive innovative solutions to public health issues.

410.707 The Psychosocial Determinants of Health, Implications on Diagnostics
In this capstone course, students will learn basic diagnostic techniques and use case studies to explore the relationship between physiological illnesses and diagnostic output. Through discussions and guided interviews, students will explore the role of psychology and sociology in patient care choices as well as physician recommendations to patients. Students will practice cultural sensitivity through group activities and discussion of pressing public health issues. Students will undertake final group projects that identify needs in the local community and attempt to create solutions they could feasibly be completed with limited resources.

LABORATORY ELECTIVE COURSES

410.652 Cell Culture Techniques
This laboratory course illustrates the use of basic cell culture techniques for bioscience research and commercial applications. Students are introduced to cell cultivation methods, including proper use of a biological safety cabinet, sterile technique, cell enumeration and media preparation, primary cultures, cultivation of cell lines, detection of contamination, cryopreservation, transfection, and an introduction to bioassays. This course is designed for students with no prior knowledge or with limited knowledge of cell culture methods. Prerequisites: 410.601 Biochemistry; 410.603 Advanced Cell Biology I

410.656 Recombinant DNA Laboratory
This laboratory course introduces students to methods for manipulating and analyzing nucleic acids. Students gain extensive hands-on experience with plasmid purification, restriction mapping, ligations, bacterial transformations, gel electrophoresis, as well as applications of the polymerase chain reaction. This course is not recommended for students with substantial experience in these methodologies. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology.

410.657 Recombinant Protein Expression, Production and Analysis
This laboratory course introduces students to the construction, production, processing, and analysis of recombinant proteins from prokaryotic and eukaryotic sources. Concepts include the design, construction, and delivery of recombinant expression clones, expression of recombinant genes in host cells, protein purification, and protein analysis. Laboratory exercises use current techniques and approaches for the cloning, expression, production, purification, and analysis of recombinant proteins in bacteria and mammalian cells. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.656 Recombinant DNA Laboratory; or consent of program committee.

410.658 Biodefense & Infectious Disease Laboratory Methods
This laboratory course introduces students to the methods and techniques used for biothreat detection, surveillance and identification. Using bio-simulants and demonstrations, various biodetection platforms will be discussed and presented, such as point-of-detection devices and methods, laboratory based screening and identification technologies (culture, RT-PCR, ECL, immunoassays, biosensors), and high-throughput environmental surveillance methods. Statistical methods for determining diagnostic sensitivity and specificity, and assay validity will be discussed. Laboratory practices and procedures for working in simulated Biosafety Level 2 and 3 environments will be practiced. Students will be introduced to the current bioinformatics genomic and proteomic databases used for select agent (category A, B and C) identification and characterization. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology I; undergraduate Microbiology or 410.615 Microbiology or approval of program committee.
**410.659 Advanced Recombinant DNA Lab**
This course is a continuation of Recombinant DNA Laboratory (410.656), intended for those who have completed the introductory course, or who have extensive molecular biology laboratory experience. This second course consists of a series of integrated laboratory exercises designed to give students hands-on experience with a variety of advanced recombinant DNA techniques. Exercises include molecular cloning; PCR optimization; site directed mutagenesis; mutation detection; measuring gene expression by quantitative real time PCR (qRT-PCR); and control of gene expression by RNA interference (RNAi). Students will be introduced to high throughput/high content screening procedures such as robotic liquid handling, microarray analysis, and utilization of bioinformatic techniques. Prerequisites: 410.601 Biochemistry, 410.602 Molecular Biology; 410.656 Recombinant DNA Laboratory; or consent of program committee.

**410.660 Immunological Techniques in Biotechnology**
This laboratory course introduces students to methods for analyzing the immune system. Participants gain experience with various immunologic techniques used in research and biotechnology laboratories such as immunossays, immunofluorescence, western blot analysis, SDS-PAGE, antibody purification (protein A), and cytokine assays. Additional topics for discussion include hybridoma technology, phage antibody libraries, therapeutic monoclonal antibodies, and flow cytometry. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology I; 410.613 Principles of Immunology or undergraduate immunology course highly recommended; or consent of program committee.

**410.853 Bioprocessing and Scale-Up Laboratory**
This course will provide students with hands-on experience in process development of biological product from a cell bank through purification. Students will develop two products; one produced in bacteria and the other in a mammalian cell culture system. Students will optimize growth conditions on a small scale and then produce the biologic in a bioreactor. Students will then purify the product after optimizing purification conditions. Topics to be covered include microbial fermentation, cell culture production, bioassays, product purification and the regulatory, engineering and business principles associated with scale-up of a biologic product. Prerequisites: 410.601 Biochemistry, 410.602 Molecular Biology, 410.603 Advanced Cell Biology I

**410.752 High Throughput Screening & Automation Lab**
This course will utilize hands-on instruction in automated bioassay systems for high throughput screening (HTS) as an entry point to covering pertinent aspects of HTS, such as data manipulation, storage, and analysis; liquid handling robotics; microtiter plate washing, manipulation and bar coding; HTS assay detectors; and automated devices for assay setup, validation and visualization. Cost considerations, HTS amenable assay systems, and miniaturization and scale-up will also be discussed. Prerequisites: All four core courses and 410.696 Bioassay Development

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**SCIENCE ELECTIVE COURSES**

**410.606 Clinical Trial Management**
The goal of this course is to provide students with a functional understanding of all the operational aspects of a clinical study. At the end of the course, students will be able to think about a study from the point of view of the Study Manager (primary focus of the course), and also from that of different team members, understand how regulations affect and guide a study, and be exposed to common issues and mistakes made during clinical trial management. Students will learn what happens at the site level and how and why sites are monitored, emphasizing potential site issues and what a study manager and team could do to resolve/prevent problems. An example study protocol will be used throughout the study and students will be required to write and review clinical site monitoring reports. Prerequisites: 410.648 Clinical Trial Design and Conduct

**410.610 Gene Organization & Expression**
Students use genetic analysis and molecular biology techniques to investigate chromosome organization, chromatin structure, functional genomics, and mechanisms of differential gene expression. Other topics include DNA methylation, silencers, enhancers, genomic imprinting, and microarray analysis. Prerequisites: 410.601 Biochemistry, 410.602 Molecular Biology

**410.611 Vaccinology**
This course will cover the biological development, immunologic concepts, and methods for vaccine delivery. Specific topics include new technologies for vaccine development such as DNA vaccines, recombinant mucosal vaccines, dendritic cells for antigen delivery, novel adjuvants, and methods to increase vaccine stability. Delivery systems for vaccines, both time tested and new methodologies such as lipid-based systems, needle-free injection systems, and novel methods such as the use of genetically modified foods, will be discussed. The underlying biological role of the innate and adaptive immune systems will be explored in light of new types of vaccines and delivery systems. Finally the process of bringing vaccines to market will be covered including government oversight and licensure. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology I; 410.613 Principles of Immunology, or undergraduate immunology course.

**410.612 Human Molecular Genetics**
In this course students learn to use the tools of modern genomics to elucidate phenotypic variation within populations. The course uses human disease (from simple Mendelian disorders to common complex disorders) to exemplify the types of studies and tools that can be used to characterize cellular pathophysiology as well as to provide genetic diagnostics and therapies. Students become facile with linkage analysis, cancer genetics, microarray analysis (oligo and DNA arrays), gene therapy, SNP studies, imprinting, disequilibrium mapping, and ethical dilemmas associated with the Human Genome Project. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology
**410.613 Principles of Immunology**

This course covers molecular and cellular immunology, including antigen and antibody structure and function, effector mechanisms, complement, major histocompatibility complexes, B- and T-cell receptors, antibody formation and immunity, cytotoxic responses, and regulation of the immune response. Students are also introduced to the applied aspects of immunology, which include immunosassay design and flow cytometry. Special topics include immunomodulation, immunosuppression, immunotherapy, autoimmunity, and vaccination. Prerequisites: 410.601 Biochemistry, 410.602 Molecular Biology; 410.603 Advanced Cell Biology I

**410.614 Pathogenic Bacteriology**

Lecture and discussion augmented by guided readings on pathogenic bacteria, with special attention to microorganisms that cause human disease. The course is designed to impart to the student an appreciation as well as knowledge of the history, epidemiology, cultivation, morphology, serology, biochemistry, and clinical description of the major disease-producing bacteria. Discussion of therapeutic considerations and vaccination will also be included in this course. Prerequisites: 410.601 Biochemistry, 410.602 Molecular Biology; undergraduate microbiology course or permission of program committee.

**410.615 Microbiology**

This course is an overview of microorganisms important in clinical diseases and biotechnology. Students are introduced to the general concepts concerning the morphology, genetics, and reproduction of these microbial agents. Lectures focus on individual organisms with emphasis on infectious diseases, biotechnology applications, molecular and biochemical characteristics, and molecular and serological identification methods. Students will also discuss the impact biotechnology, and particularly genomics, will have on the development of antibiotics and vaccines as treatment and preventive measures. Prerequisites: 410.601 Biochemistry, 410.602 Molecular Biology; 410.603 Advanced Cell Biology I

**410.616 Virology**

This course covers the advanced study of viruses with regard to the basic, biochemical, molecular, epidemiological, clinical, and biotechnological aspects of animal viruses primarily and bacteriophage, plant viruses, viroids, prions, and unconventional agents secondarily. Specific areas of virology, including viral structure and assembly, viral replication, viral recombination and evolution, virus-host interactions, viral transformation, gene therapy, antiviral drugs, and vaccines, are presented. The major animal virus families are discussed individually with respect to classification, genomic structure, virion structure, virus cycle, pathogenesis, clinical features, epidemiology, immunity, and control. The viral vectors and their applications in biotechnology are discussed. Prerequisites: 410.601 Biochemistry, 410.602 Molecular Biology; 410.603 Advanced Cell Biology I

**410.617 Marine Biotechnology**

This course covers the application of molecular techniques to study the marine environment and obtain useful products from marine systems. Students examine recent progress in discovery of drugs and enzymes from marine microbes and macroorganisms, biodiversity, bioremediation, molecular approaches in aquaculture, the role of marine microbes in global carbon cycling, and genomics of marine organisms. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology I

**410.618 Parasitology**

The field of parasitology is immense. It covers a plethora of organisms and a multitude of disciplines. This course focuses on the parasites of medical importance that cause human morbidity and mortality throughout the world. It also introduces the student to the general aspects of parasitology. The developmental biology, natural history, and cell and molecular biology of the major eukaryotic parasites will be discussed. Also, the fundamental mechanisms of host-parasite relationships, diagnosis, pathogenesis, epidemiology, and control strategies will be emphasized. Prerequisites: 410.601 Biochemistry, 410.602 Molecular Biology; 410.603 Advanced Cell Biology I

**410.619 Molecular Evolution & Phylogenetics**

This course covers the principles of molecular evolution and phylogenetics. Topics include patterns and analyses of DNA polymorphism, genetic evolutionary trees, molecular clocks, the evolution of multigene families, gene duplication and shuffling, transposition and horizontal gene transfer, gene number and genome size, organellar and nuclear genetic markers, genetic mutation and selection, genes in populations, viral evolution, human evolution, and the theoretical background for molecular phylogenetics. Examples of each concept will be drawn from the scientific literature in epidemiology and human or animal genetics. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology

**410.620 Advanced Topics in Immunology**

This course is literature based and requires a foundation in immunology. Students will be presented with current topics in Immunology through literature reviews and basic science papers from the premier journals. Topic areas may include but are not limited to: Toll-like receptors, NK cells and their receptors, microRNAs in immunology, cytokine signaling, epigenetics, T regulatory cells, tumor immunology and cancer immunotherapies, T cell subsets (memory T cells, Th1, Th2, Th9, Th17, Th22, TFH), dendritic cells, negative and positive costimulation, viral immunity including AIDS, mouse models in immunology, Fc receptors, B cell subtypes and antibodies, and allergy and asthma. Students will be required to present a paper of choice during class in one of these major topics areas. Students will be also introduced to methods predominately used in science papers such as flow cytometry, confocal microscopy, gene arrays, ELISAs, western blots, immunohistochemistry, in vivo mouse models, and microRNA arrays. Students enrolling in this course are not required to already have experience in critical reading and evaluation of the primary scientific literature. Prerequisites: 410.601 Biochemistry, 410.602 Molecular Biology, 410.603 Advanced Cellular Biology I, and 410.613 Principles of Immunology or an undergraduate immunology course.
410.621 Agricultural Biotechnology
In this course, students are introduced to the application of recombinant DNA technology to agriculture. Studied are methods for the introduction of foreign DNA into plant and animal cells and generation of stably transformed plants and animals. Students consider specific examples of the use of transgenic plants and animals in biotechnology, which can provide protection against insects, diseases, and tolerance to specific herbicides. They also investigate how recombinant growth hormones can result in leaner meat, greater milk yield, better feed utilization, and how transgenic plants and animals can serve as biofactories for the production of medicinals or protein pharmaceuticals. Because recombinant agricultural products are released into the environment or consumed as foods, students also need to become familiar with environmental safety issues. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology I

410.622 Molecular Basis of Pharmacology
This course begins by reviewing receptor binding and enzyme kinetics. Various cellular receptors and their physiology are discussed as well as the pharmacological agents used to define and affect the receptor’s function. Students study the pharmacology of cell surface receptors and intracellular receptors. Also considered are the drugs that affect enzymes. Prerequisites: All four core courses.

410.623 Molecular & Cellular Physiology
Students in this course gain an understanding of how coordinated regulation of bodily function occurs at the molecular and cellular levels of organization. The focus is on neurons, muscles, and hormones. Specific areas covered for excitable tissue include bioelectric properties of excitable membranes, Hodgkin-Huxley ion currents, voltage-gated ion channels and their structures, synaptic transmission, excitation-contraction coupling, and contractile properties of skeletal, cardiac, and smooth muscle cells. The biotechnological connection is the pharmacological interventions to modulate functioning of excitable tissues. For endocrine physiology, there is an overview of hypothalamic, pituitary, reproductive, and other hormones. The class uses leptin and obesity as a model for excitable tissue include bioelectric properties of excitable membranes, Hodgkin-Huxley ion currents, voltage-gated ion channels and their structures, synaptic transmission, excitation-contraction coupling, and contractile properties of skeletal, cardiac, and smooth muscle cells. The biotechnological connection is the pharmacological interventions to modulate functioning of excitable tissues. For endocrine physiology, there is an overview of hypothalamic, pituitary, reproductive, and other hormones. The class uses leptin and obesity as a model for the pharmacology of cell surface receptors and intracellular receptors. Also considered are the drugs that affect enzymes. Prerequisites: All four core courses.

410.624 System and Integrative Physiology
This course is the second half of the Physiology sequence and involves the study of organ systems and how they are regulated by the central nervous and endocrine systems. Students will learn the structure and function of the cardiovascular, respiratory, digestive, renal, and reproductive systems, as well as their pathophysiology during disease processes. We will also study metabolic physiology in the context of exercise and diet. The biotechnological connection will be how the drug interventions modulate functioning of many of these systems. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology I; 410.623 Molecular and Cellular Physiology is recommended but not required.

410.625 Industrial Microbiology
This course covers the principles of various processes associated with the production and recovery of different bioproducts derived from prokaryotes and eukaryotes. Topics include the classification of microorganisms, media development, instrumentation, fermentation principles, mammalian and insect cell propagation, product recovery, protein purification, and the principles of current good manufacturing practices (cGMP). Emphasis is on large-scale production methods and production of recombinant proteins for diagnostic and clinical applications. Prerequisites: 410.601 Biochemistry, 410.602 Molecular Biology, 410.603 Advanced Cell Biology I

410.626 Molecular Development
This course covers the molecular and cellular bases of development in a variety of experimental organisms with special emphasis on mammalian and human models. From the formation of germ cells, fertilization, and early embryonic development to the final formation of organs and tissues, developmental processes are considered in the context of biotechnological applications. Application possibilities include creation of transgenic animals and drug design to combat specific types of cancer. The molecular mechanisms of developmental processes and the identification of targets for therapeutic purposes are central themes. Prerequisites: All four core courses.

410.627 Translational Biotechnology: From Intellectual Property to Licensing
This course provides an extensive overview of a process for development of a pharmaceutical by a biotechnology company or pharmaceutical company. The course emphasizes the importance of intellectual property, the basic sciences underpinning the development of a product, and the importance of the interaction between a company and the Food and Drug Administration (FDA). Students learn to appreciate the importance of quality control and assurance, good manufacturing practices, preclinical and clinical testing, and the lengthy regulatory processes which govern the development, manufacture, and eventual sale of biotechnological products. Hands-on solving of practical problems and guest lecturers who are experts in the field familiarize students with the intricacies of the process. Prerequisites: 410.303 Bioscience for Regulatory Affairs, OR 410.601 Biochemistry and 410.603 Advanced Cell Biology or admission to the MS in Regulatory Science OR Masters of Biotechnology Enterprise and Entrepreneurship Programs.

410.628 Neurobiology
This course provides a framework for understanding the molecular physiology of neuronal structure, signaling, and circuitry and how this cellular design is ultimately integrated to achieve higher cognitive functions such as perception, control of movement, learning, and memory. The course introduces the students to various current neuroscience topics, including but not limited to membrane physiology and electrical excitability of neurons, neurotransmitters and synaptic transmission, signaling at the neuromuscular junction, cellular and higher-order aspects of perception and motor control, molecular mechanisms of neural development, and the molecular basis of...
learning and memory. This course places particular emphasis on the genetic and molecular bases of a wide variety of neurological and neurodegenerative diseases such as multiple sclerosis, amyotrophic lateral sclerosis, Parkinson's, and Alzheimer's. Prerequisites: All four core courses.

410.629 Genes & Disease
Because of recent advances, powerful diagnostic tests now detect genetic diseases, and there is promise of gene replacement therapy. In this course students cover general genetic principles, DNA tools for genetic analysis, cytogenetics, gene mapping, the molecular basis of genetic diseases, animal models, immunogenetics, genetics of development, genetics of cancer, and treatment of genetic diseases. Molecular methods of analysis are emphasized. Prerequisites: All four core courses.

410.630 Gene Therapy
Students are introduced to gene transfer, its technical evolution, and its testing through clinical studies. Gene therapy holds promise for both genetic diseases and acquired diseases such as cancer and AIDS. The health, safety, and ethical issues surrounding gene therapy are discussed, together with the review and oversight systems established to regulate this therapy. Students also consider how industry is developing these techniques, both in new start-up companies as well as in established biotechnology and pharmaceutical companies. An overview of proprietary and patent issues in gene therapy is part of the course. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology I

410.631 Infectious Diseases
This course focuses on infectious diseases of mankind, presented in a system-by-system format. Basic principles of host defense and microbial virulence will be discussed. Practical up-to-date information on the clinical presentation, symptoms, physical findings, laboratory diagnosis, treatment, and prevention of the general array of diseases caused by bacteria and viruses will be presented. The use of antibiotics, prophylactic agents, and vaccines along with selected aspects of pathogenesis and epidemiology will be covered. More cursory coverage will be given to the fungal and parasitic agents of human disease. The student will develop a broad understanding of the many different kinds of infectious processes to which our bodies are subjected on an ongoing basis. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; and 410.603 Advanced Cell Biology I

410.632 Emerging Infectious Diseases
This course focuses on emerging infectious diseases from many different perspectives. The maladies addressed range from diseases that have reappeared in altered genetic forms, such as the influenza virus and the West Nile virus, to the lethal hemorrhagic fever caused by the Ebola virus. Also discussed is the threat of recombinant and ancient infectious agents such as Bacillus anthracis, causative agent of anthrax, which can be used in biological warfare weapons. Opinions from noted scientists and leaders concerning emerging diseases and the prospects for battling them successfully provide scientific and social perspective. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology I

410.633 Introduction to Bioinformatics
Retrieval and analysis of electronic information are essential in today's research environment. This course explores the theory and practice of biological database searching and analysis. In particular, students are introduced to integrated systems where a variety of data sources are connected through World Wide Web access. Information retrieval and interpretation are discussed, and many practical examples in a computer laboratory setting enable students to improve their data mining skills. Methods included in the course are searching the biomedical literature, sequence homology searching and multiple alignment, protein sequence motif analysis, and several genome analytical methods. Classes are held in a computer laboratory. Acquaintance with computers is required. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology

410.634 Practical Computer Concepts for Bioinformatics
This course introduces students with a background in the life sciences to the basic computing concepts of the UNIX operating system, relational databases, structured programming, object-oriented programming, and the Internet. Included is an introduction to SQL and the Perl scripting language. The course emphasizes relevance to molecular biology and bioinformatics. It is intended for students with no computer programming background but with a solid knowledge of molecular biology. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology

410.635 Bioinformatics: Tools for Genome Analysis
Several large-scale DNA sequencing efforts have resulted in megabase amounts of DNA sequences being deposited in public databases. As such, the sequences are of less use than those sequences that are fully annotated. Assigning annotations such as exon boundaries, repeat regions, and other biologically relevant information accurately in the feature tables of these sequences requires a significant amount of human intervention. This course instructs students on computer analytical methods for gene identification, promoter analysis, and introductory gene expression analysis using software methods. Additionally, students are introduced to comparative genomics and proteomic analysis methods. Students will become proficient in annotating large genomic DNA sequences. Students complete two large sequence analysis projects during the course. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.633 Introduction to Bioinformatics; or all Bioinformatics core courses.

410.636 Biology of HIV & AIDS
This course includes an overview of the biology and life cycle of the immunodeficiency virus, including the simian viruses (SIVs). Specific areas of HIV immunopathogenesis are emphasized, to include HIV diagnosis, HIV-induced immune dysfunction, and therapeutic breakthroughs in the treatment of HIV-1 disease. Students become familiarized with current methods in biotechnology that have advanced our understanding of the biology of retroviruses. Special topics include international genetic variation (subtypes and clades), HIV vaccine development, and global economic impact. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology I
410.637 Bioethics
Students in this course analyze and discuss traditional philosophical theories regarding the nature of the moral good. They then apply these theories to critical issues and selected cases involving experiments with human subjects, organ transplantation, in-vitro fertilization, the use of animals in research, the collection and publication of research data, peer review, conflicts of interest, and other topics of current concern.

410.638 Cancer Biology
This course provides students with knowledge of the fundamental principles of the molecular and cellular biology of cancer cells. Lectures and demonstrations explain the role of growth factors, oncogenes, tumor suppressor genes, angiogenesis, and signal transduction mechanisms in tumor formation. Discussion of aspects of cancer epidemiology, prevention, and principles of drug action in cancer management is part of the course. Prerequisites: All four core courses.

410.639 Protein Bioinformatics
Because the gap between the number of protein sequences and the number of protein crystal structures continues to expand, protein structural predictions are increasingly important. This course provides a working knowledge of various computer-based tools available for predicting the structure and function of proteins. Topics include protein database searching, protein physicochemical properties, secondary structure prediction, and statistical verification. Also covered are graphic visualization of the different types of three-dimensional folds and predicting 3-D structures by homology. Computer laboratories complement material presented in lectures. Prerequisites: 410.601 Biochemistry, 410.602 Molecular Biology, 410.633 Introduction to Bioinformatics

410.640 Molecular Phylogenetic Techniques
This course will provide a practical, hands-on introduction to the study of phylogenetics and comparative genomics. Theoretical background on molecular evolution will be provided only as needed to inform the comparative analysis of genomic data. The emphasis of the course will be placed squarely on the understanding and use of a variety of computational tools designed to extract meaningful biological information from molecular sequences. Lectures will provide information on the conceptual essence of the algorithms that underlie various sequence analysis tools and the rationale behind their use. Only programs that are freely available, as either downloadable executables or as Web servers, will be used in this course. Students will be encouraged to use the programs and approaches introduced in the course to address questions relevant to their own work. Prerequisites: 410.601 Biochemistry, 410.602 Molecular Biology, 410.633 Introduction to Bioinformatics

410.641 Clinical & Molecular Diagnostics
This course covers basic concepts and practical applications of modern laboratory diagnostic techniques. Topics include the principles of testing methodology, quality assurance, and the application of molecular methods to the clinical and research laboratory. The test methods to be covered include nucleic acid-based methods such as hybridization, amplification, and sequencing; non-nucleic acid methods such as HPLC, GLC, and protein analysis; and technologies such as PFGE, ribotyping, RFLP, and serological testing methodologies. In addition to the test procedures, students are exposed to aspects of statistics, quality control, regulatory issues, and applications of these methods to the diagnosis and prognosis of human disease. Prerequisites: 410.601 Biochemistry, 410.602 Molecular Biology

410.642 Economic Dynamics of Change in Biotechnology
Governments around the world are beginning a long term process that reviews and redesigns its healthcare systems addressing concerns of innovation, cost, equitable access, and sustained quality of healthcare. As a result healthcare is undergoing significant changes globally in R&D, marketing, pricing, sales and distribution. This course helps students to understand these processes and the new business opportunities and new business models they will create. It provides some of the basics of macro- and microeconomics to clarify how economic and social forces drive changes in the pharmaceutical, biotech, and genetic industry. Emphasis will be placed on the application of economics.

410.643 Managing and Leading Biotechnology Professionals
The roles of managers and leaders within biotechnology companies undergo constant change. Biotechnology managers and leaders must engage in new and innovative problem-solving strategies; lead a diverse and global workforce; develop partnerships with other businesses, customers, and competitors; manage horizontally and across teams; and utilize technology as a competitive advantage. The student is able to address current challenges in his/her own organization and learn methods of implementing change, such as negotiation techniques and motivation. The course includes in-depth discussions of leadership skills, communication, conflict resolution, and goal integration. Students research a biotechnology organization and analyze what is working and not working within the management systems and suggest alternatives.

410.644 Marketing Aspects of Biotechnology
This course introduces students to the strategic and tactical approaches used in the marketing of biotechnological products and services. Students gain a thorough understanding of the research and planning necessary to develop a marketing plan, the relationship between the marketing and sales functions, the difference between marketing a scientific product and a scientific service, pricing strategies, distribution alternatives, communications, promotion, and the importance of perception. Knowledge of marketing terminology and techniques prove helpful to anyone in the industry.

410.645 Biostatistics
This course introduces statistical concepts and analytical methods as applied to data encountered in biotechnology and biomedical sciences. It emphasizes the basic concepts of experimental design, quantitative analysis of data, and statistical inferences. Topics include probability theory and distributions; population parameters and their sample estimates; descriptive statistics for central tendency and dispersion; hypothesis testing and confidence intervals for
means, variances, and proportions; the chi-square statistic; categorical data analysis; linear correlation and regression model; analysis of variance; and nonparametric methods. The course provides students a foundation to evaluate information critically to support research objectives and product claims and a better understanding of statistical design of experimental trials for biological products/devices. Prerequisites: Basic mathematics (algebra); scientific calculator

410.647 Research Ethics
This course covers the basic ethical notions in the conduct of biomedical research with animals and human subjects and that make up the core values of scientific integrity. Students explore issues central to these areas, such as the appropriate use of animals in research, informed consent for human subjects, authorship, peer review, and the ethics of the business of science.

410.648 Clinical Trial Design and Conduct
Through a case study approach, this course will cover the basic design issues of clinical trials, specifically targeting the Protocol, Case Report Forms, Analysis Plan, and Informed Consent. The design of a specific trial will be studied to illustrate the major issues in the design of a study, such as endpoint definition, control group selection, and eligibility criteria. The course will also cover the analysis plan for a study, including approaches that are central to clinical trials such as stratified analysis, adjustment factors, and “intention-to-treat” analysis. The planned analytical techniques will include the analysis of correlated data (i.e., clustered data, longitudinal data), survival analysis using the proportional hazards (Cox) regression model, and linear models. A semester-long project will include the creation of a Protocol, Case Report Forms, and Informed Consent. Prerequisites: 410.645 Biostatistics or equivalent (Recommended); 410.651 Clinical Development of Drugs and Biologics (Required)

410.649 Introduction to Regulatory Affairs
Regulatory affairs (RA) comprise the rules and regulations governing product development and post-approval marketing. In the U.S., the FDA establishes and oversees the applicable regulations under several statutes, many regulations, and partnership with legislators, patients, and customers. Biotechnology products may be classified as drugs, biologics, or medical devices. Each type is regulated by a different center within the FDA. This course provides an overview of RA, its effect on product development. Topics include: RA history, regulatory agencies, how to access regulatory information, drug submissions, biologics submissions, medical device submissions, GLP, GCP, GMP, and FDA inspections. (Research Administration elective. Prerequisites in Biotechnology apply. Contact the director of the MS in Research Admin.

410.650 Legal Aspects of Biotechnology
This course is an overview of the major legal principles that arise to protect and market biotechnological inventions and of the procedures required as a biotech company is established, evolves and brings products to market. The course will cover legal concepts and explore the interrelationship between business and legal challenges. The student is able to analyze business situations and identify potential legal risks. Students that have taken 410.687 Ethical, Legal and Regulatory Aspects of the Biotechnology Enterprise will benefit from this course as they will be conducting an in-depth analysis of contracts and various statutes and court decisions that impact the biotechnology industry.

410.651 Clinical Development of Drugs and Biologics
This course introduces students to the planning and work required to develop potential new drugs and biologics efficiently. Students gain a thorough appreciation of FDA and ICH regulations and guidelines. Because the course emphasizes the importance of planning before the execution of any of the necessary steps, lectures use a “backwards” approach, discussing the final analysis and report before developing protocols. Topics also include an overview of preclinical investigations; NDA/BLA format and content; clinical development plans; product and assay development; the IND; and trial design, implementation, and management. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology or admission to the MS in Regulatory Science Program.

410.652 Cell Culture Techniques
This laboratory course illustrates the use of basic cell culture techniques for bioscience research and commercial applications. Students are introduced to cell cultivation methods, including proper use of a biological safety cabinet, sterile technique, cell enumeration and media preparation, primary cultures, cultivation of cell lines, detection of contamination, cryopreservation, transfection, and an introduction to bioassays. This course is designed for students with no prior knowledge or with limited knowledge of cell culture methods. Prerequisites: 410.601 Biochemistry; 410.603 Advanced Cell Biology I

410.653 Tissue Engineering
Tissue engineering is a highly multidisciplinary field that involves cell biology, chemistry, materials science, engineering, and medicine. This course will be a survey that introduces students to the field from scientific, clinical, manufacturing, and regulatory perspectives. Roughly the first half of the course will be devoted to background material, and the second half will focus on applications. Readings will be drawn from books and journals. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology I

410.655 Radiation Biology
This course will review types of ionizing radiation and their differences, physical and chemical interactions of radiation with key biological molecules, effects on living matter beginning with molecular and cellular interactions and proceeding to tissue, organ, and organism levels, emphasizing the human system. Radiation’s beneficial effects in cancer therapy and medicine as well as detrimental and carcinogenic effects will be discussed. Specific units will consider food irradiation, nuclear power plant accidents, radiation terrorism, everyday sources of exposure to the US population, and other practical situations involving radiation. Prerequisites: 410.601 Biochemistry, 410.602 Molecular Biology, 410.603 Advanced Cell Biology I
410.656 Recombinant DNA Laboratory
This laboratory course introduces students to methods for manipulating and analyzing nucleic acids. Students gain extensive hands-on experience with plasmid purification, restriction mapping, ligations, bacterial transformations, gel electrophoresis, as well as applications of the polymerase chain reaction. This course is not recommended for students with substantial experience in these methodologies. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology

410.657 Recombinant Protein Expression, Production and Analysis
This laboratory course introduces students to the construction, production, processing, and analysis of recombinant proteins from prokaryotic and eukaryotic sources. Concepts include the design, construction, and delivery of recombinant expression clones, expression of recombinant genes in host cells, protein purification, and protein analysis. Laboratory exercises use current techniques and approaches for the cloning, expression, production, purification, and analysis of recombinant proteins in bacteria and mammalian cells. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.656 Recombinant DNA Laboratory; or consent of program committee.

410.658 Biodefense & Infectious Disease Laboratory Methods
This laboratory course introduces students to the methods and techniques used for biothreat detection, surveillance and identification. Using bio-simulants and demonstrations, various biodetection platforms will be discussed and presented, such as point-of-detection devices and methods, laboratory based screening and identification technologies (culture, RT-PCR, ECL, immunoassays, biosensors), and high-throughput environmental surveillance methods. Statistical methods for determining diagnostic sensitivity and specificity, and assay validity will be discussed. Laboratory practices and procedures for working in simulated Biosafety Level 2 and 3 environments will be practiced. Students will be introduced to the current bioinformatics genomic and proteomic databases used for select agent (category A, B and C) identification and characterization. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.656 Recombinant DNA Laboratory; or consent of program committee.

410.659 Advanced Recombinant DNA Lab
This course is a continuation of Recombinant DNA Laboratory (410.656), intended for those who have completed the introductory course, or who have extensive molecular biology laboratory experience. This second course consists of a series of integrated laboratory exercises designed to give students hands-on experience with a variety of advanced recombinant DNA techniques. Exercises include molecular cloning; PCR optimization; site directed mutagenesis; mutation detection; measuring gene expression by quantitative real time PCR (qRT-PCR); and control of gene expression by RNA interference (RNAi). Students will be introduced to high throughput/high content screening procedures such as robotic liquid handling, microarray analysis, and utilization of bioinformatic techniques. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.656 Recombinant DNA Laboratory; or consent of program committee

410.660 Immunological Techniques in Biotechnology
This laboratory course introduces students to methods for analyzing the immune system. Participants gain experience with various immunologic techniques used in research and biotechnology laboratories such as immunoassays, immunofluorescence, western blot analysis, SDS-PAGE, antibody purification (protein A), and cytokine assays. Additional topics for discussion include hybridoma technology, phage antibody libraries, therapeutic monoclonal antibodies, and flow cytometry. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology 1; 410.613 Principles of Immunology or undergraduate immunology course highly recommended; or consent of program committee.

410.661 Methods in Proteomics
This course covers the analytical methods used to separate and characterize pharmaceutical compounds (predominantly proteins) derived through biotechnology. While emphasis is placed on the general principles and applicability of the methods, current protocols are discussed, and problem sets representing realistic developmental challenges are assigned. Topics include chromatography (HPLC, SEC, IEC), electrophoretic techniques (2-D gel electrophoresis), spectroscopic methods (UV/Vis, fluorescence, CD), analytical ultracentrifugation, microarrays, mass spectroscopy, amino acid analysis, sequencing, and methods to measure protein-protein interactions. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology.

410.662 Epidemiology: Diseases in Populations
Epidemiology is the study of the patterns and determinants of disease in populations. It constitutes a basic science for public health and biomedical sciences and its influence can be felt daily through the presentation of data by government, academic, and industry sources. The goal of this course is to present an introduction to epidemiological methods and inferences to biotechnology professionals with little prior experience in public health. Issues in epidemiological inference and the assessment of causal relationships from epidemiological studies will be discussed, introducing the issues of bias and confounding. Throughout the course, emphasis will be on the practical use of epidemiology and lectures will be complemented by case studies and published literature. Examples will be drawn from contemporary issues in chronic and infectious diseases. At the conclusion of the course, students should have a greater appreciation for the role of the epidemiologic method and be able to evaluate a basic epidemiologic study, including how the study goals and research questions relate to the design, measures, and inferences. Recommended Prerequisites: Undergraduate statistics course or 410.645 Biostatistics

410.663 Current Topics in Molecular & Cellular Biology
This course is a literature-driven exploration of current topics and methodologies employed in cell biology research. By closely examining both fundamental and innovative experimental approaches, as well as cutting-edge technologies, we will explore a broad range of cell biology topics, many of which most students have previously encountered, at least at some level, in the core courses. The particular subjects and technologies discussed may vary widely from semester to
semester; topics may include but are not limited to expression profiling (microarray analysis), "knock-down" with RNAi, the use of transgenic and knock-out mice, proteomics and mass spectrometry, microscopy applications (epifluorescence, confocal, and/or EM), characterizing protein/protein interactions, and detection methods for the movement of small molecules and ions. Students enrolling in this course are expected to already have some experience in critical reading and evaluation of the primary scientific literature. Prior to graduation, four core courses.

410.665  Biology Communication
Researchers must communicate effectively so their discoveries can be shared with others. In this course, students learn how to communicate their ideas to other researchers, their scientific peers, and investment communities. Students master both written and verbal communication skills; they hone their expertise at making both formal and informal oral presentations; they prepare poster presentations, and develop their own public speaking strategies. The course also presents personal strategies for improving daily communications, cross-cultural communications, and non-verbal skills. Students improve their written communication, editing, and informal writing skills. Participants also learn effective e-mail strategies for getting their message across, and learn how effective writing can improve their chances of getting grant applications approved. Class assignments include preparation of scientific papers, general science writing, oral presentations, PowerPoint presentations, and scientific posters.

410.666  Next Generation DNA Sequencing and Analysis
The recent revolution in DNA sequencing technologies has transformed biology within a few short years, dropping the cost and ease of sequencing dramatically to the point where the "$1,000 Human Genome" is in sight. Armed with complete genome sequences, biologists need to identify the genes encoded within and the variation in these genes between individuals, assign functions to the genes, and to put these into functional and metabolic pathways. This course will provide an overview of next generation sequencing technologies in the historical context of DNA sequencing, the pros and cons of each technology, and the bioinformatics techniques used with this sequence information, beginning with quality control assessment, genome assembly and annotation. Prerequisites: 410.602 Molecular Biology; 410.633 Introduction to Bioinformatics; 410.634 Practical Computer Concepts for Bioinformatics

410.667  Theory/Appi Immunoassays
Antibodies are useful as molecular tools in a variety of applications in biotechnology. They can be produced quickly, inexpensively, and in very large quantities. Students will examine how antibodies can be configured as a measurement tool called an immunoassay. Students design immunoassays for their own laboratory applications such as radio- and enzyme-immunoassays, and competitive and immunometric immunoassays. They learn how to modify antibodies chemically for conjugation of reporter molecules; and they become aware that various immunoassay performance issues can affect results. Students also investigate immunoassay formats such as

410.669  Immunology of Infectious Diseases
Immunology of Infectious Diseases is a lecture-based, advanced topics course designed for students who have a background in immunology and medical microbiology. The course provides a detailed description of specific pathogens (bacterial, viral, parasitic and fungal) and their interactions with the human immune system, including innate and acquired immunity. Pathogens covered in detail may include: mycobacterium (tuberculosis), gram-negative enteric bacteria (bacillary dysentery), paramyxovirus (measles virus), enterovirus (poliovirus), plasmodium parasites (malaria), intestinal protozoa (amoebiasis), trichinella, and candidiasis (thrush) and other opportunistic mycoses. Immunology topics covered in detail include: mucosal immune responses, the role of PRR and PAMPs; pathogen regulation of host immune response; pathogen evasion of immune effector mechanisms; polarization of CD4+ T helper cell subsets, mechanisms of immunopathogenesis, and vaccine design. Lectures will be supplemented with talks from scientific experts from the field. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology I

410.670  Biology of Stress
This course explores stress from a multidisciplinary perspective beginning with a history of stress research, which began in the early 20th century. Because of the interdisciplinary nature of the subject matter, a detailed consideration of anatomy and functioning of the central and peripheral nervous systems will be discussed. In addition, students will examine how stress affects the endocrine, cardiovascular, reproductive, digestive, and immune systems. Students will also learn the role of stress in cognition and complex behaviors such as memory, mood, appetite, sleep, and sexual desire. Animal and human studies will be discussed as well as current pharmacological treatments. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology I

410.671  Microarrays & Analysis
This course will focus on the analysis and visualization of microarray data. The general aim is to introduce students to the various techniques and issues involved with analyzing multivariate expression data. Additionally, students will visualize the results in modern statistical scripting software. Topics include detecting and attributing sources of data variability, determining differentially expressed genes with relevant statistical tests, and controlling for false positive discovery (multiple test corrections, permutations, etc.). An introduction to linear and non-linear dimension reduction methods (PCA, PLS, isometric feature mapping, etc.) and an introduction to common pattern recognition (clustering), classification, and discrimination techniques will be included. Assignments and concepts will make use of publicly available Affymetrix and cDNA microarray data sets. Examples will mostly be demonstrated in S-plus and R (publicly available)
Biotechnology Studies

410.673 Biological Processes in Regulatory Affairs
This course provides an overview of the biological processes and laboratory techniques utilized for the discovery, development and evaluation of therapeutic drugs. Students investigate drug development processes such as gene cloning, culture scale-up, downstream processing, and product purification. Emphasis is placed on the theory and application of laboratory methods used in drug development, such as recombinant DNA techniques, antibody technology, protein purification, immunoassays, high-throughput drug screening, chromatography, electrophoresis, cell receptor characterization, pharmacokinetics, drug toxicity testing and evaluation of therapeutic drugs, diagnostics, and vaccines. Prerequisites: 410.303 Bioscience for Regulatory testing and evaluation of therapeutic drugs, diagnostics, and vaccines.

410.674 Food Microbiology
Food microbiology encompasses the study of microorganisms which have both beneficial and deleterious effects on the quality and safety of raw and processed meat, poultry, and egg products. Food microbiology focuses on the general biology of the microorganisms that are found in foods including: their growth characteristics, identification, and pathogenesis. Specifically, areas of interest which concern food microbiology are: food poisoning, food spoilage, food preservation, and food legislation. Pathogens in product, or harmful microorganisms, result in major public health problems in the United States as well as worldwide and is the leading causes of illnesses and death.

410.675 International Regulatory Affairs
The pharmaceutical/biotechnology product approval and marketing requires a good understanding of international regulatory affairs in order to successfully compete in today’s global market place. It is important for tomorrow’s leaders to understand and follow the regulatory differences to ensure optimum product development strategies, regulatory approvals and designs for exports conforming to the foreign regulatory bodies. There are various product development strategies that industry is using to shorten the product development time by conducting preclinical programs outside the US, however, the strategy requires a careful planning and interaction with the US and foreign regulatory agencies. With the increase in globalization of economy and exports, international regulations will have a bigger impact on the biotechnology business in the future. The course provides a review and analysis of the pharmaceutical/biotechnology product approval processes within the world’s major markets. The key strategies required in preclinical product development to marketing approval of the products in Europe, Japan, and the US will be compared and discussed. Students will explore the European Union (EU) regulations and their overall importance on international markets. The course will cover the salient features of common technical and regulatory documents required for submission and approval to the leading regulatory bodies in the world, general guidance documents, International Harmonization, and General Agreement on Tariffs and Trade (GATT).

410.676 Food And Drug Law
The Food, Drug, and Cosmetic Act (FD&C Act) governs the regulatory approval process for bringing a drug, biologic, medical device, food, or cosmetic to market. The class will discuss administrative procedures followed by the FDA. The course includes an overview of the drug, biologic and medical device approval processes and the regulation of food and dietary supplements. Students then will be exposed to the enforcement activities of the FDA, including searches, seizure actions, injunctions, criminal prosecutions, and civil penalties authorized under the FD&C Act, as well as other statutes like the Public Health Service Act (which regulates the development and approval of biologics).

410.677 Preparing a Successful Submission
The federal Food, Drug, and Cosmetic Act (FD&C Act) requires that a drug be the subject of an approved marketing application before it is transported or distributed across state lines. Because a sponsor will likely enter interstate commerce in the preparation or study of the investigational drug, it must seek an exemption from that legal requirement. The Investigational New Drug Application, or IND, is the means by which a sponsor obtains this exemption from the FDA. The New Drug Application, or NDA, is the application which when approved by the FDA, provides the legal basis for marketing a new drug product. Beginning with the IND and moving through the NDA this course provides a comprehensive review and discussion of the IND and NDA and all related submissions required for life cycle maintenance of the applications.

410.678 Marketing in a Regulated Environment
This course is designed to help students, understand, use, and comply with the laws, regulations, and policy guidance documents governing advertising and promotion of products regulated by the Food and Drug Administration (FDA). The course provides an overview of the regulations, discussion of the FDA’s advertising oversight, and FDA enforcement activities. The course content introduces students to advertising approved products. It provides insights on comparing competitor products and the need for head-to-head comparative data, dietary supplements, Rx products, OTC products, unapproved investigational products, and unapproved research products. The course also covers the different regulations from FDA, FTC, and CPSC. Labeling requirements, DoT, OSHA, and other international activities are also covered.

410.679 Practicum in Regulatory Science
This integrative case-based course will focus on applying knowledge gained from previous courses in the MS in Regulatory Science program to actual cases from the U.S. Food and Drug Administration. For each case, students will assume the role of regulatory specialist, an FDA reviewer or senior-level policy-maker, or other involved stakeholders, such as a consumer group or an advocacy group. Students will be
expected to research, evaluate, and present scientifically and legally justifiable positions on case studies from the perspective of their assigned roles. Students will present their perspectives to the class and be asked to debate the issues with the other students from the perspective of their assigned roles. The major responsibility of the students in this course will be to make scientifically and legally defensible recommendations and to justify them through oral and written communication. Please note this course is only open to students in the MS in Bioscience Regulatory Affairs and should only be taken after all required courses are completed.

410.680 Managerial Finance for Biotechnology I

(Formerly Financial Development for Biotechnology)
The management of money is a key ingredient for the success of any enterprise, and even more so for the entrepreneur seeking to achieve both translation of an idea to a product while concurrently making money for the investors. Students will become aware of the challenges business leaders are faced with during each milestone of a company's development. In this course we begin with the basics of money management such that the student will learn the correct vocabulary and understand the important concepts when speaking to potential investors. Students will analyze a term sheet, a contract and a balance sheet. Important topics include understanding the concepts of risk and the time value of money. Students will study real world biotechnology issues, mergers and acquisitions to enhance the value of the course.

410.681 Commercializing Biotechnology

This advanced course provides an integrated and practical approach to considering the principal areas of concern an entity faces when commercializing biotechnology, from creating or obtaining the technology through partnering with others to further develop and commercialize the technology, and finally selling the business or business line that incorporates that technology. The focus of this course is to highlight key junctures in a biotechnology company's evolution; help students identify key financial, management, and business issues at those junctures; and present practical alternatives for students to consider to resolve those issues. This course builds upon 410.650 Legal Aspects of Biotechnology and 410.646 Creating a Biotechnology Enterprise, but they are not prerequisites for the course.

410.682 Validation in Biotechnology

Understanding validation and applying a comprehensive validation philosophy are essential in today’s biotechnology industry. First and foremost, validation allows a company to operate in compliance with the regulations and guidance set forth by FDA. Perhaps more importantly, it results in equipment, assays, and processes that are well understood and robust, less prone to failure, and more cost-effective. This course will introduce the fundamentals of validation, validation master planning, resource management, types of validation and the associated documentation, departmental roles and interaction, and the differences between commissioning and validation. Students will have an opportunity to solve real-world problems, generate actual validation documents, and develop validation program elements that balance regulatory requirements, operational needs, and business expectations.

410.683 Introduction to cGMP Compliance

Current Good Manufacturing Practice regulations are the minimum standards for the design, production, and distribution of drugs, biologics and medical devices in the U.S. and internationally. In the U.S., they are codified at the federal level, in the FD&C Act and the CFR, and actively enforced by FDA. These regulations, however, only begin to describe the practices used in the pharmaceutical and biotech industries. Additional sources of insight and guidance include FDA’s guidance documents and training manuals, industry trade publications, international compendia, and standards-setting organizations. Students will learn the scope and history of the regulations, industry-standard implementation strategies and “best-practices” approaches, and FDA’s current expectations. Students will also learn to apply practical solutions to the regulatory issues faced in the pharmaceutical and biotech industries today.

410.684 Technology Transfer & Commercialization

This course is an introduction to the multidisciplinary aspects involved in the process of bringing technical developments, particularly research emanating from universities and other nonprofit organizations, into commercial use. The course will provide an overview of the key policies, concepts, tools, issues, practices, and trends that are shaping the technology transfer field, with an emphasis on the life sciences sector.

410.685 Emerging Issues in Biotechnology

Biotechnology impacts the world and our social, political, and physical environment in ways many both inside and outside the industry may not fully understand or appreciate. It is critical to ensure that advances in biotechnology be accompanied by important public, political, and social considerations and discussions. This course will cover issues including domestic and global public perception of biotechnology, its benefits and risks, advances in bioagriculture and genetically modified foods, the impact of recombinant therapeutics on the pharmaceutical and healthcare industry, ways in which advances in biotechnology have and will continue to change our views of what life is, and how the political climate impacts advances in biotechnology discoveries. This highly interactive course will include thought-provoking debate and discussion with industry leaders, both proponents and opponents of biotechnology.

410.686 Regulation of Good Food Production Practices

Good Food Production Practices are production and farm level approaches to ensure the safety of food for human consumption. Good food production and post-harvest guidelines are designed to reduce the risk of foodborne disease contamination. These good food production procedures can be tailored to any production system and are directed toward the primary sources of contamination: soil, water, hands, and surfaces. Good food production protocols were developed in response to the increase in the number of outbreaks of foodborne diseases resulting from contaminated food. Students will learn to develop good food production regulatory protocols using case studies.

410.687 Ethical, Legal & Regulatory Aspects of the Biotechnology Enterprise

This course provides an overview of the important ethical, legal and regulatory issues that are critical to the biotechnology
industry. The course shares current trends and essential elements of ethics, legal issues and regulations in a way that allows for an appreciation of how each influences the others. Students will examine core ethical values that guide the practice of science in the biotechnology industry. The course will provide an overview of legal issues such as protecting inventions and intellectual property and licensing, and the range of regulatory oversight mechanisms with which the biotech industry must comply. This course will review the implications of strategic ethical, legal and regulatory choices that add value to the biotechnology firm, customers and society. (Research Administration elective. Prerequisites in Biotechnology apply. Contact the director of the MS in Research Admin).  

410.688 Project Management in Biotechnology  
Today, many organizations use the approach called “Project Management”; to handle activities that have a limited life span, as opposed to routine, ongoing operations. This course will answer the question “What do I do to be successful?” The units will provide guidance for project management success by considering each phase in the life of a typical project, from concept to closeout. We will discuss the nature of project management, the structure of projects, working with teams of technical experts, and all the other activities that make project management different from any other discipline. The course will rely heavily on group discussions. Topics will include deciding what to do, developing a project plan, risk management, team leadership, monitoring and controlling during the project, scope change control, and traditional and modern approaches to project closeout. Concepts presented will be consistent with the Project Management Institute’s “Guide to the Project Management Body of Knowledge”, the U.S. standard for project management.

410.689 Leading Change in Biotechnology  
As bioscience companies grow and mature, leadership needs evolve. Students will learn how to identify their company’s position in the “Leadership Life Cycle” and learn how to select the right leadership capabilities based on their current organizational needs. Research shows that the right leaders at the right time dramatically improve organizational success. Discussions will address the leadership needs of organizations from early stage research-based companies through fully integrated bio-pharmaceuticals. General leadership practices and strategies, moving ideas from research bench to the consumer, and strategies to prevent failure will all be discussed.

410.692 Biological & Chemical Threat Response & Forensics  
This course introduces the methods and techniques used for biological and chemical threat agent characterization; methods of detection, identification, medical intervention, and forensic attribution are also discussed. Lectures cover a broad variety of topics pertaining to the use of biological and chemical agents including: historical background of biological and chemical agents in classic and discretionary warfare; the introduction of scientific evidence in criminal proceedings and chain of custody for evidentiary materials in crimes and terrorism; quality assurance in laboratory operations; threat containment; decontamination and remediation; health and safety of responders and analysts; and risk assessments. Laboratory methods employed in the characterization and forensic analysis of biological (bacterial, viral, biological toxins, agricultural threats), and chemical agents (classic military chemical agents, toxic industrial chemicals and materials) will also be discussed. General overviews of techniques and sample collection for classic biological and chemical agents (PCR, DNA sequencing methods, immunological analyses); and for chemical agents (gas chromatography and mass spectrometry). Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology I; undergraduate Microbiology or 410.615 Microbiology.

410.693 Science, Medicine & Policy in Biodefense  
This course provides a comprehensive introduction to the Concentration in Biodefense. Biological warfare is introduced in its historical context, followed by the properties of the most important biological threat agents, their medical consequences and treatment, diagnostics and forensics. Relevant international and domestic policy issues are explored, along with defense strategies and the nature of existing dangers to national security. Students should leave the class with a deep understanding of biological warfare and terror agents, the consequences of their potential use, and the available means of protection. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology I; undergraduate Microbiology or 410.615 Microbiology.

410.695 Applied Molecular Biology  
This course covers both basic and applied concepts in molecular biology. It is designed for students with a good working knowledge of molecular biology who want to study more advanced concepts and how they may be applied in biotechnology. Topics for discussion include DNA/ RNA structure, DNA replication, transcription, translation, posttranslational modifications, restriction enzymes, general recombinant DNA techniques (DNA ligations, bacterial transformation, DNA/RNA isolation), DNA sequencing, plasmids, and polymerase chain reaction. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; and 410.603 Advanced Cell Biology I.

410.696 Bioassay Development  
This course will cover methodological approaches to bioassay development for high throughput screening. Both cell-based (cytotoxicity; cytoprotection, high content imaging, and reporter systems) and cell-free assay systems (enzyme, FRET, time resolved fluorescence, quenching assays, and immunological assays) will be included with discussion of the potential promise and pitfalls associated with each assay system. Various assay formats, visualization techniques, and current developments in assay technology will be discussed. Project management techniques will be utilized to aid in the process of assay development. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology and 410.603 Advanced Cell Biology I.

410.697 Microfluidics and Biosensors  
Microfluidics (Lab-on-a-chip technology) is the miniaturization of laboratory operations for micro-scale chemistry, high-throughput drug screening, environmental sensors, biothreat
detectors, forensics, clinical diagnostics and proteomics. This course will cover microfluidic implementations of bioassay development such as sample dilution, cell lysis, chromatography, solid-phase extraction, electrophoresis, nucleic acid amplification and sequencing, analyte detection, single-cell analysis, microarray design and mass spectrometry sample preparation. The materials, design, fabrication, and testing of microfluidic chips and biosensors will be discussed, with emphasis on the applications of this technology to detect microbial pathogens and cancer markers. In addition, the course will include case studies from the literature to introduce students to intellectual property issues related to microfluidic technology. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology or approval of program committee.

410.698 BioPerl
This course builds on the Perl concepts taught in 410.654 Practical Computer Concepts for Bioinformatics. Perl has emerged as the language of choice for the manipulation of bioinformatics data. Bioperl, a set of object-oriented modules that implements common bioinformatics tasks, has been developed to aid biologists in sequence analysis. The course will include an overview of the principal features of Bioperl and give students extensive opportunity to use Perl and the tools of Bioperl to solve problems in molecular biology sequence analysis. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.654 Practical Computer Concepts for Bioinformatics

410.699 Nanobiotechnology
The emerging field of nanobiotechnology utilizes developments in nanotechnology and molecular biology for applications to biomedical science and clinical practice, as well as fundamental cell biology research and industrial biotechnology. Nanobiotechnology is an interdisciplinary field that exploits the unique functional properties of natural and synthetic biomolecular-sized (nanometer-scale) constructs such as quantum dots, carbon nanotubes, nanostructured surfaces, liposomes, artificial membranes, and molecular machines for biotechnology and medicine. This course is designed for biotechnology majors and will survey the research, development, and applications of nanobiotechnology to medical diagnostics, imaging, and therapeutics (including drug delivery and anticancer treatments); cell biology and single-cell analysis, nanofluidics, bioassays, biosensors, and bio-inspired engineering. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.603 Advanced Cell Biology I; 410.604 Advanced Cell Biology II

410.700 Food Labeling and Packaging Regulations
The Nutrition Labeling and Education Act of 1990 (NLEA), which amended the FD&C Act requires most foods to bear nutrition labeling and requires food labels that bear nutrient content claims and certain health messages to comply with specific requirements. The NLEA and the final regulations to implement the NLEA, provide for a number of fundamental changes in how food is labeled, including requiring that nutrition labeling be placed on most foods, requiring that terms that characterize the level of nutrients in a food be used in accordance with definitions established by FDA, and providing for the use of claims about the relationship between nutrients and diseases or health-related conditions. These changes apply to virtually all foods in the food supply, including, in large measure, to foods sold in restaurants. Food labeling is required for most prepared foods, such as breads, cereals, canned and frozen foods, snacks, desserts, drinks, etc. Nutrition labeling for raw produce (fruits and vegetables) and fish is voluntary.

410.701 Introduction to Food Safety
This course is designed to understand the legal and regulatory complexities of the regulation of food products in the United States. The prime issues including regulatory compliance in food safety and Hazard analysis and Critical Control points (HACCP) are among major issues to control the food supply. The Food and Drug Administration (FDA) and the US Department of Agriculture (USDA) have primary responsibility for safety of meat and food products. Based on the principles of HACCP, FDA issued seafood regulations effective in Dec. 1997. However, the regulation of food additives, labeling, dietary supplements, genetic modifications (GM) and the protection of the food supply will provide the in-depth of food regulation in the United States. The FDA and USDA regulate the safe practice of primary and secondary food products to the American public. Depending upon the source and nature of food product, the method of shipment, advertisement of nutritional values etc. are being governed by FDA and USDA’s jurisdictions. The Food safety Modernization Act overhauls the FDA in food surveillance, enforcing regulations on specific targets, inspections records examination, and exemptions. In this course students will learn the existing food regulations and safety net by examining the product tracing, performance standards and preventive control plans towards food safety, security, genetic modifications, dietary supplements, and food labeling etc. Students will have option to design projects to propose effective food safety net that can assist in the supply chain of nation’s food safety and security.

410.702 Biomedical Software Regulation
Software continually grows more complex and is becoming relied upon by healthcare professionals in the treatment of patients. This course describes how the U.S. government regulates software used in delivering healthcare including the regulations utilized by the Food and Drug Administration (FDA), as well as, the Center for Medicare and Medicaid Services (CMS). This course covers a wide range of topics, including: FDA regulation of software as a medical device and software validation, medical imaging software regulation, electronic recordkeeping and software used in clinical trials, laboratory information management systems (LIMS), and HIPAA privacy rules and security standards.

410.703 Strategic Planning for the Biotechnology Enterprise
This course is an overview of the strategic planning process of a biotechnology enterprise. It focuses on creating value through strategy formulation and implementation. Topics covered include leadership and technology competencies, performance indicators, intellectual property, corporate governance, regulatory strategy and appropriating value. The thesis of the course is that effective strategic planning and implementation
is critical to success, and that is provides a valuable, structured process to create enterprise value and to manage business risks. Best practices in strategic planning and managing the planning process also are provided.

410.704 Social Entrepreneurship in BioScience
This course will explore how biotechnology innovators are solving social issues including developing medical diagnostics, discovering effective and safer medicine, producing cleaner energy, remediating environmental contamination and improving crop yields. Students will think broadly in terms of roles required in tackling these social, economic, health and environmental issues and how they can add value to society. This course will cover social entrepreneurship principles and practices in a range of sectors including corporate social responsibility and public value missions in emerging markets. Students will have opportunities to define their role in advancing biotechnology as it relates to the top global challenges.

410.705 Communication for Health Care Professionals
In this course, students will practice both oral and written communication techniques and learn how to effectively communicate in formal and informal arenas. Students will work together to improve daily communications with peers, colleagues and potential patients. Coursework will focus on specific oral competencies including interviewing and being interviewed and cross-culture communications as well as specific written competencies including application essays, email communications and interview summaries. In all communications, emphasis will be given to getting their message across through logical and concise writing techniques. Additionally, students will discuss how communication strategies can be used to encourage or hinder changes in patient behavior and incite changes in public health.

410.706 Building and Leading Teams in Health Care
In order to provide the best care possible, health care professionals are working together more now than ever before. As a result, strong leadership and teamwork skills are becoming a necessity in joining the health care field. This course will provide hands-on activities to help students develop problem solving skills, learn basic negotiation and mediation strategies, and understand their own tendencies as a leader and team member. Using real world examples, students will explore how strong leadership and teamwork can drive innovative solutions to public health issues.

410.707 The Psychosocial Determinants of Health, Implications on Diagnostics
In this capstone course, students will learn basic diagnostic techniques and use case studies to explore the relationship between physiological illnesses and diagnostic output. Through discussions and guided interviews, students will explore the role of psychology and sociology in patient care choices as well as physician recommendations to patients. Students will practice cultural sensitivity through group activities and discussion of pressing public health issues. Students will undertake final group projects that identify needs in the local community and attempt to create solutions they could feasibly be completed with limited resources.

410.710 Economic Policy and Support Structures the Bio Entrepreneur
This course will explore how key actors are establishing support and advocating legislative priorities for biotechnology innovations. Students will review economic development of biotechnology clusters and local, state and federal policy factors that impact the biosciences and public views on this sector. Students will have opportunities to explore the services and support available in advancing biotechnology.

410.712 Advanced Practical Computer Concepts for Bioinformatics
This intermediate-to-advanced level course, intended as a follow-on to 410.634 Practical Computer Concepts for Bioinformatics (a prerequisite for this new class), will integrate and expand on the concepts from that introductory class to allow students to create working, Web-based bioinformatics applications in a project-based course format. After a review of the concepts covered in 410.634, students will learn how to create functional Web applications on a UNIX system, using Perl and CGI to create forms that can be acted upon, and using the Perl DBI module to interface with MySQL relational databases that they will create and populate to retrieve and present information. This will be demonstrated by building an in-class, instructor led project. More advanced SQL concepts and database modeling will also be covered, as well as introductions to HTML5, CSS3 and Javascript. Class time in the latter weeks of the class will be devoted to individual assistance on student projects as well as to short lectures on advanced topics. Once again, whenever possible, this course will emphasize relevance to solving problems in molecular biology and bioinformatics. Pre-requisites: 410.601 Biochemistry, 410.602 Molecular Biology, 410.634 Practical Computer Concepts

410.712 Advanced Practical Computer Concepts for Bioinformatics
This intermediate-to-advanced level course, intended as a follow-on to 410.634 Practical Computer Concepts for Bioinformatics (a prerequisite for this new class), will integrate and expand on the concepts from that introductory class to allow students to create working, Web-based bioinformatics applications in a project-based course format. After a review of the concepts covered in 410.634, students will learn how to create functional Web applications on a UNIX system, using Perl and CGI to create forms that can be acted upon, and using the Perl DBI module to interface with MySQL relational databases that they will create and populate to retrieve and present information. This will be demonstrated by building an in-class, instructor led project. More advanced SQL concepts and database modeling will also be covered, as well as introductions to HTML5, CSS3 and Javascript. Class time in the latter weeks of the class will be devoted to individual assistance on student projects as well as to short lectures on advanced topics. Once again, whenever possible, this course will emphasize relevance to solving problems in molecular biology and bioinformatics. Pre-requisites: 410.601 Biochemistry, 410.602 Molecular Biology, 410.634 Practical Computer Concepts for Bioinformatics

410.713 Advanced Genomics and Genetics Analysis
The next generation of array and sequencing technologies provides the ability to investigate large quantities of genomics...
information with higher sensitivity, greater throughput, and lower costs. This also introduces new challenges in data management, novel algorithmic approaches, and general interpretation. This course builds on the topics in 410.671 Microarrays and Analysis to address analysis of both genetic variation and genomics content using technologies measuring splice variants, single nucleotide polymorphisms (SNPs), copy number variation (CNV), and transcription factor binding sites. Analysis methods for deep sequencing technologies are also introduced including: quantitative mRNA content (RNA-Seq) and whole genome assembly methods with de novo and reference-based approaches. Prerequisites: Molecular Biology, Introduction to Bioinformatics, Microarrays

410.715 Medical Device Regulation
This course provides a comprehensive introduction into medical devices and how they are regulated by the US Food and Drug Administration (FDA). Topics that will be covered include: (1) an overview of the laws and regulations that govern medical devices; (2) FDAs organizational structure and responsibilities for medical device regulation; and (3) administrative and legal requirements for medical devices throughout the full product life-cycle. Particular focus will be placed on the premarket review, postmarket programs enforcement (e.g., Quality System regulation, and FDA inspectional programs). Included will be discussions on the responsible offices and major program requirements and resources. Students will be given various case studies to examine the application of regulations, as well as, participate in a 510(k)/PMA workshop, mock inspectional audit, and a mock enforcement action. Upon completion of this course, the student will have a working knowledge of the requirements and policies of FDA regulation of medical devices.

410.716 Food Toxicology
Food toxicology is the study of the nature, properties, effects, and detection of toxic substances in food, and their disease manifestation in humans. This course will provide a general understanding of toxicology related to food and the human food chain. Fundamental concepts will be covered including dose-response relationships, absorption of toxicants, distribution and storage of toxicants, biotransformation and elimination of toxicants, target organ toxicity, teratogenesis, mutagenesis, carcinogenesis, food allergy, and risk assessment. The course will examine chemicals of food interest such as food additives, mycotoxins, and pesticides, and how they are tested and regulated.

410.717 Risk Assessment and Management
Risk analysis is composed of three separate but integrated elements, namely risk assessment, risk management and risk communication. Risk communication is an interactive process of exchange of information and opinion on risk among risk assessors, risk managers, and other interested parties. Risk management is the process of weighing policy alternatives in the light of the results of risk assessment and, if required, selecting and implementing appropriate control options, including regulatory measures. Students will learn how to integrate risk assessment, risk management, and risk communication using case studies.

410.718 Food Safety Audits and Surveillance
Food safety audits provide a credible verification system to the entire food processing industry including retail environments, meat, fish, and poultry, vegetable and produce suppliers. Having a HACCP plan in place is often a first step to a successful food safety program, but is not entirely enough to ensure that food safety standards are being adhered to on a consistent basis. In this course, students will learn how to adequately plan for a food recall or crisis situation.

410.722 Research Ethics
This course covers the basic ethical notions in the conduct of biomedical research with animals and human subjects and that make up the core values of scientific integrity. Students explore issues central to these areas, such as the appropriate use of animals in research, informed consent for human subjects, authorship, peer review, and the ethics of the business of science.

410.727 Regulatory Strategies in Biopharmaceuticals
Given the costly drug development process and the limited resources of emerging biopharmaceutical companies, developing an early regulatory strategy- starting well before clinical trials are initiated, is extremely important for the success of a company. This course will discuss different regulatory strategies that several players of the US biopharmaceutical industry have employed. Students will learn about interacting with regulatory agencies, the orphan drug development, accelerated approval, fast track, priority review, and other regulatory mechanisms, pharmacogenomics and biomarkers, adaptive clinical trials, animal rule, generic drug development and biosimilars. Using case studies, the impact of these regulatory strategies on drug development and how these strategies have helped many biopharmaceutical companies will be discussed. At the end of this course, students will better understand federal regulations and the aspects involved in developing efficient regulatory strategies.

410.728 Managing Innovation in the Life Sciences
Innovation is the creation of value from new ideas, concepts, methods, materials, and organizational structures. Life Sciences organizations that seek to create value for their stakeholders must do so using available capital resources: financial capital, human capital, intellectual capital and physical capital. They should manage those resources to gain leverage and maximize value realized. They then seek to defend and control the value created. Why then, do most organizations treat innovation (and innovators) in ways similar to the body’s immune system (i.e., by identifying the innovators, isolating them, “killing” them, and ejecting them from the organization)? This course will explore innovation, invention, and value creation as a driving force in the biotechnology or life sciences enterprise and the ways in which managers should plan to take full advantage of innovation as the only true competitive weapon for long term success. A special emphasis will be placed on innovation as applied to life science applications (biotechnology, medical devices, health care delivery, drug discovery, development and packaging, bioinformatics, etc.). Topics include invention, ROI, disruption, creative destruction, types of innovation, technology brokering, organizational structures that foster innovation,
planning and managing for innovation. Students are required to read extensively, participate actively in discussions, do case studies, and develop a convincing pitch for an innovation project.

410.729 Regulatory & Economic Fundamentals of Drug Pricing & Reimbursement
The US government is now the single largest purchaser of drugs in the world. As the realities of the economic crisis and long term health care reform take root, pricing of pharmaceutical products and the reimbursement regulations that attach to drugs will shape research and development for years to come. As regulatory hurdles continue to climb, the burden of proof will increasingly continue to be on the pharmaceutical industry to prove the value of an individual pharmaceutical product. This course will examine the elements of pharmaceutical pricing and reimbursement to better understand accepted drug pricing models, and how both government and industry look at drug pricing and reimbursement. This will include cost-efficiency modeling of the drug development and manufacturing process, therapeutic cost utility and cost benefit analysis, US and international pharmaceutical product registration, accepted methods for valuing pharmaceuticals, macro- and microeconomic analysis and drug development decision modeling as part of a framework for health care economic evaluation, and the political and ethical underpinnings of health care reform as it reflects on the need for government and society to define the fundamentals of drug pricing and reimbursement. The goal will be to provide the framework for the pharmaceutical industry professional to better understand the regulatory and economic fundamentals of drug pricing and reimbursement.

410.731 Bioprocessing and Scale-Up Laboratory
This course will provide students with hands-on experience in process development of biological product from a cell bank through purification. Students will develop two products; one produced in bacteria and the other in a mammalian cell culture system. Students will optimize growth conditions on a small scale and then produce the biologic in a bioreactor. Students will then purify the product after optimizing purification conditions. Topics to be covered include microbial fermentation, cell culture production, bioassays, product purification and the regulatory, engineering and business principles associated with scale-up of a biologic product. Prerequisites: 410.601 Biochemistry, 410.602 Molecular Biology, 410.603 Cell Biology 1

410.732 Funding a New Venture
This course is designed to introduce students to the new venture creation, concept pitching and company funding processes from a venture capital perspective. Students will learn how to take a new idea, technology or business model and evaluate its merits for forming a new biotech venture. Students will also engage in projects and real-world experiences to learn how to develop a business plan for presentation to potential investors. The class will also utilize case studies and guest speakers to provide insight into how entrepreneurs successfully pitch their ventures to investors to obtain funding for building new companies.

410.733 Comparative Animal Physiology
This class examines animal physiology from an evolutionary and comparative viewpoint. The goal is to examine the commonalities, as well as unique differences, in how various animal organisms address the necessary life functions. Topics will include homeostatic mechanisms as an overarching theme, integrating the following systems: nervous, endocrine, muscle, circulatory, defense, respiratory, excretory, fluid and acid-base balance, digestive, energy balance and thermal, reproductive.

410.734 Practical Introduction to Metagenomics
The emerging field of metagenomics allows for the study of entire communities of microorganisms at once, with far-reaching applications in a wide array of fields such as medicine, agriculture and bioremediation. Students will learn the principles of metagenomics through exploration of published project data and guided readings of recent literature. Using data from the Human Microbiome Project, students will explore practical analysis tasks including sequence assembly, gene prediction and annotation, metabolic reconstruction, taxonomic community profiling and more. Prerequisites: 410.601 Biochemistry, 410.602 Molecular Biology; 410.634 Practical Computer Concepts for Bioinformatics

410.736 Genomic and Personalized Medicine
This integrative course will be of interest to a wide variety of students in different concentration areas. Applying knowledge from their core courses and introductory bioinformatics, students will examine the current applications of whole genome sequencing and genome wide association studies in clinical medicine, and explore evolving applications and their impact on future medical diagnoses and treatments. Students will review both established and emerging sequencing platforms in detail. This course will closely examine whole genome sequencing applications in inherited and heritable diseases and cancer, amongst others. Class discussions will include ethical, legal, regulatory, and economic implications of genomic medicine. Students and faculty will regularly report on new developments in the field as they emerge throughout the course. Prerequisites: 410.601 Biochemistry; 410.602 Molecular Biology; 410.633 Introduction to Bioinformatics

410.750 Molecular Targets & Cancer
This course will investigate potential molecular targets in cancer including receptor tyrosine kinases, G-Protein coupled receptors, the TGF beta signaling pathway, cell cycle check points, kinases and phosphatases, chemokine and chemokine receptors, nuclear receptors, suppressor proteins, metastasis and angiogenesis targets, integrins, and matrix metalloproteinases. Discussion will also include topics on what defines a molecular target and the methods by which they are evaluated. Prerequisites: All four core courses.

410.751 Chemical Libraries & Diversity
Chemical diversity and “pharmacological space” will be studied with an emphasis on disciplines related to drug discovery. Medicinal chemistry, natural product chemistry, focused synthetic libraries, and combinatorial chemistry will be covered. Lipinski’s rules for drug-like molecules will be discussed in detail, as well as methods for chemical analysis,
in silico drug design, molecular modeling, and compound storage and handling. In addition, techniques used for assessing and harnessing chemical diversity for drug discovery will be discussed. Prerequisites: All four core courses or approval of program committee.

**410.753 Stem Cell Biology**

This course will involve discussion and debate on current topics concerning stem cell biology and the use of stem cells in biotechnology and therapeutics. Topics will include review and discussion of developmental and cell biology, stem cell characteristics, stem cell preparation and therapeutic uses, tissue engineering, global regulatory and ethical issues, and commercialization of stem cell therapy. Current peer-reviewed literature and guest experts in the field will provide up to date information for discussion. Prerequisites: All four core courses.

**410.754 Comparative Microbial Genomics: From Sequence to Significance**

Hundreds of bacterial and archaeal genomes have been completely sequenced and thousands more will follow in near future. In this course we will learn how to make sense of this vast sea of information in order to understand the diversity of microbial life on earth: transforming DNA data into knowledge about the metabolism, biological niche and lifestyle of these organisms. The use and development of bioinformatic platforms for the sensible comparison of genetic function and context are essential for work in modern microbiology. Topics covered will include methods for sequencing, gene finding, functional prediction, metabolic pathway and biological system reconstruction, phylogenomics, ontologies, and high-throughput functional genomics. Particular attention will be paid to publically available bioinformatics resources and their proper use. Examples will be drawn from microbes of importance to human health, industry, ecology, agriculture and biodefense. Lectures and discussions are integrated with computer exercises where appropriate. Prerequisites: 401.601 Biochemistry, 410.602 Molecular Biology, 410.633 Introduction to Bioinformatics

**410.756 Grants and Federal Funding for Biotechnology Enterprises**

This course is designed to help students working for life sciences companies understand the fundamentals of obtaining government funding for product/technology research and development. While the emphasis will be on grant funding from the National Institutes of Health, other Federal and state funding mechanisms will also be covered. Students will learn how to search for funding opportunities and receive an overview of the NIH funding mechanisms as well as background and history of the Small Business Innovation Research (SBIR) program. The course will provide insights on preparing an SBIR proposal and submission procedure. Fundamentals of government contracting law will also be covered.

**410.777 BioFuels**

In this course, students are introduced to the current technologies used in the production of biofuels. These technologies include ethanol distillation using a variety of biomass raw materials such as corn, sugar cane, cellulosic waste materials, and beer waste. Students will also study the methods used to produce biodiesel using agricultural products, such as soybeans and canola, used vegetable oil, and algae. They will also investigate the production of hydrogen from algae and bacterial sources. Students will also study the biodigester and how it can be used to transform waste into energy. In addition to studying the techniques used to produce biofuels, students will also discuss the economic and environmental impacts of using agricultural biomass sources, since many of these are also food sources. Pre-requisites: 410.601 Biochemistry, 410.602 Molecular Biology, 410.603 Advanced Cell Biology I

**410.799 Current Topics in Regulatory Policy**

The ability to successfully navigate the intersections of law, regulation, guidance, and policy has never been more critical to the success of entities engaged in the medical product development and commercial marketing. The entities that make-up this industry are very sophisticated in their abilities to innovate at a blazing speed. In contrast, regulators must use a regulatory model that evolves and adapts much slower than their industry counterparts. As a result, regulators are relying more heavily on policy to drive their strategy, actions, and outcomes. Therefore, a clear understanding of regulatory policy is an essential consideration for individuals engaged in the medical product development industry. This course provides an introduction into several key areas of government regulatory policy (both old and new) and regulatory science. The topics covered in this course will serve as a road map for students who want to successfully navigate within this complex and changing regulatory model.

**410.800 Independent Research in Biotechnology**

Students in the biotechnology program have the opportunity to enroll in an independent research course. This elective course is an option after a student has completed at least eight graduate-level courses and has compiled a strong academic record. Prior to proposing a project, interested students must have identified a research topic and a mentor who is familiar with their prospective inquiry and who is willing to provide guidance and oversee the project. The research project must be independent of current work-related responsibilities as determined by the project mentor. The mentor may be a faculty member teaching in the biotechnology program, a supervisor from the student’s place of work, or any expert with appropriate credentials. Students are required to submit a formal proposal for review and approval by the biotechnology program committee. The proposal must be received by the Advanced Academic Programs office no later than one month prior to the beginning of the term in which the student wants to enroll in the course. Students must meet with a member of the program committee periodically for discussion of the project’s progress, and a written document must be completed and approved by the program committee and project mentor for the student to receive graduate credit. Additional guidelines can be obtained from the AAP administrative office. Prerequisites: All four core courses and four elective courses.
410.801 Biotechnology Thesis
Students wishing to complete a thesis may do so by embarking on a two semester thesis project, which includes 410.800 Independent Research Project and 410.801 Biotechnology Thesis courses. This project must be a hypothesis-based original research study. The student must complete 410.800 Independent Research Project and fulfill the requirements of that course, including submission of project proposal, final paper and poster presentation, before enrolling in the subsequent thesis course. For the thesis course, students are required to submit a revised proposal (an update of the 410.800 proposal) for review and approval by the faculty advisor and biotechnology program committee one month prior to the beginning of the term. Students must meet the faculty advisor periodically for discussion of the project’s progress. Graduation with a thesis is subject to approval by the thesis committee and program committee, and requires the student to present their project to a faculty committee both orally and in writing. Prerequisites: All required Regulatory Science courses and three elective courses, which must include 410.802 Independent Studies in Regulatory Science and 410.645 Biostatistics.

410.802 Independent Studies in Regulatory Science
Students in the regulatory science program have the opportunity to enroll in an independent study course. This elective course is an option after a student has completed at least five graduate-level courses and has compiled a strong academic record. Prior to proposing a project, interested students must have identified a study topic and a mentor who is familiar with their prospective inquiry and who is willing to provide guidance and oversee the project. The study project must be independent of current work-related responsibilities as determined by the project mentor. The mentor may be a faculty member teaching in the regulatory science program, a supervisor from the student’s place of work, or any expert with appropriate credentials. The goal of the study project should be a “publishable” article. Students are required to submit a formal proposal for review and approval by the regulatory science program committee. The proposal must be received by the Advanced Academic Programs office no later than one month prior to the beginning of the term in which the student wants to enroll in the course. Students must meet with a member of the program committee periodically for discussion of the project’s progress, and a written document must be completed and approved by the program committee and project mentor for the student to receive graduate credit. Additional guidelines can be obtained from the AAP administrative office. This course is open only to students in the MS in Regulatory Science program or the MS in Biotechnology with a concentration in Regulatory Affairs and may be taken only after 5 courses have been completed.

410.803 Regulatory Science Thesis
Students wishing to complete a thesis may do so by embarking on a two semester thesis project, which includes 410.802 Independent Studies in Regulatory Science Project and 410.803 Biotechnology Thesis courses. This project must be either a hypothesis-based or research question-based original research study. The student must complete 410.802 Independent Research Project and fulfill the requirements of that course, including submission of project proposal, final paper and poster presentation, before enrolling in the subsequent thesis course. For the thesis course, students are required to submit a revised proposal (an update of the 410.802 proposal) for review and approval by the faculty advisor and biotechnology program committee one month prior to the beginning of the term. Students must meet the faculty advisor periodically for discussion of the project’s progress. Graduation with a thesis is subject to approval by the thesis committee and program committee, and requires the student to present their project to a faculty committee both orally and in writing. Prerequisites: All required Regulatory Science courses and three elective courses, which must include 410.802 Independent Studies in Regulatory Science and 410.645 Biostatistics.

410.804 Practicum in Biotechnology Enterprise & Entrepreneurship
This course synthesizes the knowledge and skills acquired in the Master in Biotechnology Enterprise and Entrepreneurship program, while offering a real world examination of a bioscience organization and the issues it faces. Students will form interdisciplinary teams and work with faculty and industry professionals on an authentic and current project from a local bioscience public or private company, an entrepreneurial start-up, or a nonprofit organization. This course is only open to students completing the Master in Biotechnology Enterprise and Entrepreneurship program.

410.805 Practicum in Project Management
This course synthesizes the knowledge and skills acquired in the Certificate in Biotechnology Enterprise Project Management Focus. It offers students a real world examination of a bioscience organization as it develops and implements project management solutions and addresses related problems and issues. Students will work with faculty and industrial professionals on an authentic and current project from a local bioscience public or private company, an entrepreneurial start-up, or a nonprofit organization. This course is only open to students completing the Certificate in Biotechnology Enterprise, Project Management Focus.

410.806 Independent Studies in Biotechnology Enterprise and Entrepreneurship
Independent Studies in Biotechnology Enterprise and Entrepreneurship provides students an opportunity to apply knowledge gained from previous courses in a real world situation. Prior to proposing a project, interested students must have identified a study topic, and a mentor (or work with the program committee to identify a project and a mentor) who is familiar with their prospective inquiry and who is willing to provide guidance and oversee the project. The study project must be independent of current work-related responsibilities as determined by the project mentor. The project can be at your work but must be outside your normal course of duties. The mentor may be a faculty member teaching in the enterprise program, a supervisor from the student’s place of work, or any expert with appropriate credentials. Students are required to submit a formal proposal for review and approval by the enterprise and entrepreneurship program committee. The proposal must be received by the Advanced Academic Programs office no later than one month prior to the beginning of
the term in which the student wants to enroll in the course. Students must meet with a member of the program committee periodically for discussion of the project's progress, and a written document must be completed and approved by the program committee and project mentor for the student to receive graduate credit. Additional guidelines can be obtained from the AAP administrative office. The student will work with the instructor on a proposal that does not duplicate other course work. The student will work independently on a project such as forming a new business venture or commercializing a product. A written business plan and oral presentation are required. Please note that this course is only open to students in the MBEE and should only be taken after all required courses are completed.
Master of Arts in Communication

The MA in Communication program helps professionals advance or switch their careers. Although many of our students are already working in communication, some are transitioning from another field. Regardless, the majority of our graduates claim that the master’s degree helps with getting a new position. Our alumni are managers, directors, vice-presidents, presidents, and other leaders in various organizations, such as government agencies, associations, non-profits, and corporations. Students and alumni have access to our exclusive job opportunities network and Career Services Center.

DEGREES

Master of Arts in Communication

The MA in Communication requires 10 courses. Full-time students can complete their coursework in one year. Students enrolled part-time can earn their degrees in about two years or take up to five years if they wish. Students who work full-time can take a maximum of two courses per semester, and those working part-time or not at all can take three to four courses per semester.

Dual Master of Arts in Communication and Master of Business Administration

The university allows students to simultaneously pursue a Master of Arts in Communication in the School of Arts and Sciences and a Master of Business Administration at the Carey School. To pursue these dual degrees, students must apply and be accepted to both programs. Students who successfully complete the requirements for both degrees will receive two separate degrees. Students may complete one degree first and be awarded the diploma before continuing with the second degree or strive toward both degrees concurrently. Pending graduates must complete the graduation application for each school. Dual degree students may participate in both commencement exercises.

Combined Master of Arts in Communication and Certificate in Nonprofit Management

The university allows students to simultaneously pursue a Master of Arts in Communication and Certificate in Nonprofit Management in the School of Arts and Sciences. To be in the combined program, students must apply and be accepted to both programs. Students who successfully complete the requirements for both the master’s degree and certificate will receive two separate documents. Students may complete one program first and be awarded the diploma or certificate before continuing with the second program, or work in both programs concurrently. Pending graduates must complete the graduation application for each program. Combined degree students participate in a single commencement exercise.

Read more about the MA in Communication program and start an application online at communication.jhu.edu or contact us at 202.663.5776

APPLICATION

Individuals who wish to apply for the MA in Communication program must do so through the Advanced Academic Programs. (The Admissions Committee reserves the right to request additional information from applicants, if needed, to assess their candidacy for admission. All application materials submitted to the Advanced Academic Programs become the property of the Johns Hopkins University and will not be returned to applicants under any circumstances.)

Prerequisites

Prospective students must hold a bachelor’s degree with a minimum grade point of average (GPA) of 3.00 (or the equivalent from outside the U.S.) prior to enrolling in the MA in Communication program.

Application Requirements

All Students

> AAP application.
> Nonrefundable application fee.
> Resume: Include any part- or full-time work, internships, and volunteer history. Detail any responsibilities related to communication.
> Statement of purpose: Explain why you are interested in earning the MA in Communication and how it will help your career or other goals. Double space your essay and limit it to 500 words or less (place the word count at the end of the document).
> Writing sample: Please go to the online application to download instructions and an article for your writing sample. This exercise asks you to write a single, brief paragraph. It should not take the form of a larger document, such as a letter, an email, a report, or a plan. Submit one paragraph with no more than 250 words.

> Two recommendations: Professors or supervisors should verify academic and professional accomplishments. The department prefers that they complete the AAP recommendation form rather than a letter.

> Official transcripts: For U.S. graduates, transcripts should show all undergraduate and graduate coursework completed within the U.S. only. (We accept official transcripts sent electronically through Scrip-Safe or Docufide, or in sealed institutional envelopes. If a transcript comes in a sealed envelope, it must be dated within the past three months.)

> GRE Scores, if necessary: The MA in Communication program waives this requirement for applicants who have (a) a cumulative undergraduate GPA of 3.0 or higher or (b) five or more years of full-time work experience after earning an undergraduate degree. Submit results directly to the Advanced Academic Programs Office of Admissions, using the code 8747. Photocopies will not be accepted.

**International Students**

> Foreign credential evaluation: Students who earned their post-secondary degree(s) in a country other than the U.S. are required to have a “course-by-course” credential evaluation with GPA performed by an outside evaluation service. Study abroad may be exempt.

> TOEFL or IELTS scores: International students who have not graduated from an accredited college or university in the U.S. and whose native language is not English must take the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS). Submit results directly to the Advanced Academic Programs Office of Admissions, using the code 8747. Photocopies will not be accepted. For the TOEFL, AAP requires a minimum score of 500 on the paper test, 250 on the computer-based test, and 100 on the Internet-based test. AAP requires an IELTS bandscore of 7.0.

**Student Status**

At the time of admission, students fall under one of the following statuses: degree, provisional, conditional, or special. Degree candidates fulfill all academic requirements at the time of application. In contrast, provisional students do not meet the requirements but demonstrate promise toward completing the MA in Communication program; therefore, they must pass a prerequisite course before being able to request a change of status from provisional student to degree candidate. Conditional students are in their last semester of undergraduate study at the time of application and must submit an official transcript verifying degree conferral prior to registering for their second semester. Special students qualify as degree candidates but wish to take fewer than the 10 courses required for conferral of the MA in Communication.

**Student Visas**

International students who have been admitted as degree, provisional, or conditional candidates and who take at least three courses per semester, which is full-time classification, may request certification for an F1 visa. Students for whom this may be a possibility should indicate Yes on their admissions application at the appropriate checkbox regarding initiating the visa process. The Admissions Office of the Advanced Academic Programs will assist in the certification process (aapadmissions@jhu.edu) which the student must complete with the Office of International Services.

**CURRICULUM**

The curriculum of the MA in Communication program aims for the following learning outcomes for students:

1. Provide theoretical knowledge about the social science of communication that students can use on the job to produce more effective messages and strategic communication programs.
2. Provide real-world job skills and training for students to move into the field of communication or move up to jobs that require more responsibility and greater knowledge.
3. Improve students’ critical thinking, problem solving, and writing skills.
4. Help students develop into communication professionals who understand how to conduct, read, evaluate, and use research to further their professional objectives.

Electives meet the second learning outcome, while required and core courses address the remaining learning outcomes. All courses help students develop strong portfolios that they can present to their current or prospective employers.

Students must take a total of 10 courses. Each semester, courses are offered onsite and online, but due to popular demand, more courses are online than onsite. For this reason, students who prefer being onsite may have to take some courses online. At the same time, we cannot guarantee that a particular course will be offered online in any given semester (i.e., it may be offered onsite only).

Students have the option of following a strategic planning or research track. Note that the orders of the courses in the lists below do not necessarily reflect the order in which students take their courses; students should work with their advisors to determine the best coursework plan.

Provisional students who choose the strategic planning or research track must take:

> Communication in Practice

Degree candidates who choose the strategic planning track must take:

> Research and Writing Methods

> At least three core courses from the Informing Practice
Degree candidates who choose the research track must take:

> Research and Writing Methods
> At least two core courses from the Informing Practice through Research group
> At least one core course from the Applied Research for Communication Professionals group
> Thesis and, if necessary, Thesis Continuation
> Five electives

Prerequisite Course
Provisional students who choose the strategic planning or research track must pass Communication in Practice during their first semester in the MA in Communication program before changing from provisional student to degree candidate and enrolling in Research and Writing Methods. Students who earn a B- or below in Communication in Practice or any other course are dismissed.

480.603 Communication in Practice

Required Courses
Degree candidates who choose the strategic planning or research track must pass Research and Writing Methods during their first semester before enrolling in any core courses. In addition, degree candidates on the research track must take Thesis and if necessary Thesis Continuation during their last semesters. Students may not take a leave of absence while completing their theses. Students who earn a C or below in a required course must repeat that course.

480.600 Research and Writing Methods
480.800 Thesis
480.888 Thesis Continuation

Core Courses
Core courses fall within the Informing Practice Through Research and Applied Research for Communication Professionals groups. Students must complete Research and Writing Methods before taking core courses. Strategic planning students can enroll in Practicum in their last semester; research track students must take Thesis in their last semester. Students who earn a C or below in a core course may not count that course toward core requirements.

Informing Practice through Research Group
480.601 Introduction to the Digital Age
480.602 Changing Behavior through Communication
480.604 Theory of Mass Communication Practices
480.606 Persuasion
480.804 Practicum

Applied Research for Communication Professionals Group
480.608 Applied Quantitative Research
480.609 Applied Qualitative Research

Electives
Students may take electives in any of the areas listed below, regardless of concentration. Students may take additional core courses as electives.

CONCENTRATIONS
Students are not required to specify a concentration. Students who want a concentration may identify one, or occasionally two, of the fields listed below. A single course cannot count toward two concentrations. Students may take electives in any area regardless of concentration. To earn a concentration, students may have to take in-person and online courses. Although it is possible for online students to earn a concentration, we cannot guarantee enough courses will be available online for all concentrations. Concentrations appear on transcripts but not diplomas.

Public and Media Relations
The concentration in public relations covers everything from pitching and planning to budgeting and executing a comprehensive communication campaign. Private companies, non-profit organizations, and federal agencies all employ communication strategies and need employees knowledgeable in theory and practice. Students must complete at least three of the following electives:

480.603 Communication in Practice
480.622 Branding by Motion Picture
480.629 Public Relations in the Age of Digital Influence
480.634 Journalism and Publishing in the Digital Age
480.635 Communication.org: Not-for-Profits in the Digital Age
480.637 Using Social and Digital Media
480.638 Utilizing Images: Media Literacy in Practice
480.642 Corporate Social Responsibility Campaigns
480.643 Branding and Advertising
480.645 Health Literacy, Language and Culture
480.651 Sports Branding and Marketing
480.653 Communicating for Social Change
480.654 Strategic Communication Program Management
480.657 Introduction to Public Relations
480.659 Public Relations Writing
480.659 Crisis Communication
480.660 Media Relations
480.661 International Public Relations and Public Diplomacy
480.662 Opinion Writing
480.663 Integrated Marketing Communication
480.665 Speech Writing
480.668 Understanding Markets and Audiences
480.669 Emergency and Risk Communication
480.670 Law for Communication Professionals
480.678 Spokesperson Development and Training
480.681 Communication Evaluation
Political Communication
The concentration in political communication addresses issues from campaign strategies to running a press office to influencing public policy. Whether people are governing, running for office, or pushing for policy change, communication lies at the heart of politics. Students must complete at least three of the following electives:

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<td>480.622</td>
<td>Branding by Motion Picture</td>
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<td>480.623</td>
<td>Political Communication Campaigns</td>
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<td>480.624</td>
<td>Press Secretary: Theory and Practice</td>
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<td>480.632</td>
<td>Digital Political Strategy</td>
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<td>480.645</td>
<td>Health Literacy, Language and Culture</td>
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<td>480.658</td>
<td>Public Relations Writing</td>
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<td>Crisis Communication</td>
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<td>480.661</td>
<td>International Public Relations and Public Diplomacy</td>
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<td>Opinion Writing</td>
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<td>480.665</td>
<td>Speech Writing</td>
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<td>480.668</td>
<td>Understanding Markets and Audiences</td>
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<td>480.670</td>
<td>Law for Communication Professionals</td>
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<td>480.671</td>
<td>Government Relations and Lobbying</td>
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<td>480.672</td>
<td>Polling for Strategic Communication</td>
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<td>480.675</td>
<td>Public Policy Management and Advocacy</td>
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<td>480.677</td>
<td>Grassroots Communication</td>
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<td>Spokesperson Development and Training</td>
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<td>480.681</td>
<td>Communication Evaluation</td>
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Health Communication
The concentration in health communication covers how to develop and evaluate effective public information campaigns, how to manage the demands placed on communication specialists during a crisis, and how to incorporate behavior-change messages into a variety of channels and genres such as entertainment. Health communication professionals must develop, deliver, and evaluate modern health communication programs. This concentration explores what has been done, what works, and why. Students must complete at least three of the following electives:

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<td>480.653</td>
<td>Communicating for Social Change</td>
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<td>480.654</td>
<td>Strategic Communication Program Management</td>
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<td>480.659</td>
<td>Crisis Communication</td>
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<td>480.668</td>
<td>Understanding Markets and Audiences</td>
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<td>480.669</td>
<td>Emergency and Risk Communication</td>
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<td>Law for Communication Professionals</td>
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<td>480.672</td>
<td>Polling for Strategic Communication</td>
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<td>480.681</td>
<td>Communication Evaluation</td>
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<td>480.682</td>
<td>Health Psychology and Behavior Change</td>
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<td>480.686</td>
<td>Behavior Change and Education through Entertainement</td>
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<td>480.687</td>
<td>Intercultural Communication</td>
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Digital Communication
The concentration in digital communication examines the strategic use of digital technologies for communication professionals. This concentration addresses how to use the web and social media to reach out to diverse public groups and how to incorporate digital with traditional communication campaigns. Digital communication tools are an important part of the modern communication workplace. Students must complete at least three of the following electives:

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<tr>
<td>480.629</td>
<td>Public Relations in the Age of Digital Influence</td>
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<td>480.630</td>
<td>Multimedia Authoring</td>
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<td>480.631</td>
<td>Effective Web Design and Strategy</td>
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<td>480.632</td>
<td>Digital Political Strategy</td>
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<tr>
<td>480.633</td>
<td>Interactive Marketing and Advertising</td>
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<tr>
<td>480.634</td>
<td>Journalism and Publishing in the Digital Age</td>
</tr>
<tr>
<td>480.635</td>
<td>Communication.org: Not-for-Profits in the Digital Age</td>
</tr>
<tr>
<td>480.636</td>
<td>Web Writing and Content Strategy</td>
</tr>
<tr>
<td>480.637</td>
<td>Using Social and Digital Media</td>
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<tr>
<td>480.638</td>
<td>Utilizing Images: Media Literacy in Practice</td>
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<td>480.671</td>
<td>Communication Evaluation</td>
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Corporate and Non-Profit Communication
The concentration in corporate and non-profit communication examines all of the important components of communication in an organizational context. Students study how managers communicate with staff, how businesses and non-profits communicate with the media, and how advertisers and marketers persuade potential consumers and donors. Successful organizations have solid internal and external communication strategies. Students must complete at least three of the following electives:

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<tr>
<td>480.642</td>
<td>Corporate Social Responsibility Campaigns</td>
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<td>480.645</td>
<td>Health Literacy, Language and Culture</td>
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<td>480.646</td>
<td>Managerial Communication</td>
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<td>480.651</td>
<td>Sports Branding and Marketing</td>
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<td>Communicating for Social Change</td>
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Applied Research in Communication
The concentration in applied research prepares students to assess the research needs of a communication effort; design theory-based formative, process, and summative evaluation studies; execute quantitative and qualitative methods; analyze data using thematic, descriptive, and inferential approaches; and use results to plan and refine communication efforts. Students must complete all of the following cores and electives.

- 480.608  Applied Quantitative Research
- 480.609  Applied Qualitative Research
- 480.681  Communication Evaluation
- 480.804  Practicum

COURSE DESCRIPTIONS

Required Courses

480.600  Research & Writing Methods
Communication professionals take on diverse and multiple roles within and across organizations, but they share one role in common as strategic problem solvers. This course will teach you how to find, read, interpret, evaluate, and apply scientific research studies to solve practical problems encountered by communication practitioners. Topics covered include how to effectively use library resources to find research that can be of strategic value; how different research methods, including focus groups, case studies, surveys, and experiments are used in communication research; how to evaluate the quality of research reports; how to interpret qualitative and quantitative findings, including statistics; and how to distill the information found in research reports down to what is most relevant and usable. In addition to learning how to become a competent and critical research consumer, you will also be exposed to current research across different areas of the communication discipline.

480.800  Thesis
This course is designed to guide students through the thesis process. It is the last course students take in finishing their masters’ degrees. Students select a topic for original research and conduct and write up their research in the course of the class. Students are encouraged to select a topic that will be useful in the workplace and that can be part of their professional portfolio. Graduation is subject to approval of the thesis by the thesis committee and completion of a successful defense. Students are encouraged to enter the class with a clear idea of what they would like to research. All core courses must be completed before starting Thesis.

480.888  Thesis Continuation
Students not finishing the thesis during the term in which they enroll in the Thesis course must enroll in Thesis Continuation in every ensuing semester (including summer) until they complete their degrees. It is not possible to take a semester off or a leave of absence while working on the thesis.

Core Courses

480.601  Introduction to the Digital Age
The digital age is changing how communication professionals communicate with public groups and how people access, understand, and process information. As a result, digital tools are an increasingly important part of the modern communicator’s tool kit. This course examines empirical research that will help communication professionals in the digital age. Topics include creating usable and credible websites and effective internet advertising. The course also examines blogs, social networking, and digital journalism. The digital age is explored through primary research across a range of subjects including public relations, political communication and health communication. Prerequisite: Research and Writing Methods

480.602  Changing Behavior through Communication
The goal of many communication initiatives is to encourage some type of behavior change. Communication professionals who understand how people change their behavior can create more successful campaigns. This course surveys major theories used to predict when and under what circumstances individuals are most likely to change their behavior. Behavior change includes a variety of actions, such as voting for a candidate, purchasing a product, joining a social networking group, or adopting a new health habit. Individual-level, interpersonal level, and community-level models of change are covered. By becoming familiar with specific theories and the empirical support for those theories, students learn how to use social science based models to guide their communication strategies effectively. Prerequisite: Research and Writing Methods

480.604  Theory of Mass Communication Practices
This course surveys major theories and perspectives on how mass media can influence individuals, organizations and society, with a focus on content areas that have the most strategic relevance for public relations practice. The course covers readings on the role media plays in shaping what issues people attend to, how they think about those issues and potential outcomes; how public relations practitioners attempt to use media strategically to meet their objectives; and the implications that current media systems, technologies, and practices have for their media relations efforts. Prerequisite: Research and Writing Methods

480.606  Persuasion
This course addresses two questions of vital importance to communication professionals: what aspects of a message make it persuasive (or not), and what attributes of individual people and audiences make them susceptible or resistant to influence. The course examines all varieties of messaging, from individuals communicating one-on-one, to messages communicated via mass media. We study topics such as how
the expertise, trustworthiness, and likeability of a spokesperson can enhance or weaken a message's persuasiveness, and how people's social groups can affect their willingness to believe. The course draws on both theory and empirical evidence to provide students with a well-rounded understanding of influence and persuasive strategies in today's world. Prerequisite: Research and Writing Methods

480.608 Applied Quantitative Research
This hands-on course guides students through the various types of quantitative research they may need to perform on the job, such as, analyzing an audience, testing a message, doing a media audit, or demonstrating the effectiveness of a department. Students learn how to develop and design good surveys, experiments, and quantitative content analyses, and how to run basic statistics on their data including the following: chi-square, t-test, and correlation. Students also learn how to write up and present the results of their research. Students should take this course prior to the semester in which they begin their research for Thesis or Practicum. Prerequisite: Research and Writing Methods.

480.609 Applied Qualitative Research
Communication professionals use qualitative methods to craft messages that resonate with audiences. This hands-on class exposes students to qualitative research methods that can be used on the job to guide communication efforts more strategically. Students learn how to design and conduct studies to gain insight into audience perceptions on a variety of issues. Specific techniques covered include in-depth interviews, focus groups, qualitative content analyses, and case studies. Through applied activities, students learn how to collect, analyze, and present qualitative research data. Students should take this course prior to the semester in which they begin their research for Thesis or Practicum. Prerequisite: Research and Writing Methods.

480.804 Practicum
Strategic-planning students complete the Practicum course during their last semester in the MA in Communication program. This optional core course offers a culminating experience that helps students integrate new or enhanced capabilities into a significant evidence-based project relevant to their profession. Each student can identify an organization or individual in need of support for a communication-related project and how to fulfill that need. In addition, the student must prepare (a) a proposal that outlines objectives, scope of work, any deliverables, timeline, and method for evaluating achievement of objectives; and (b) any final deliverables. The student must complete the Practicum course in one semester.

Elective Courses

480.603 Communication in Practice
Communication is a fast-changing field that requires practitioners to keep current with trends in technology, audience segmentation, needs of stakeholders, message techniques, evaluation methods, and much more. Equally important, practitioners must master new ways of branding themselves in a competitive job environment. This course covers up-to-date perspectives in communication practice so that students gain a concrete understanding of the practice environment. The content includes strategic management, presentation styles, ethics, branding, campaigns, evaluation, cultural diversity, client tactics, and professional networking. Experts in practice will lecture and lead class activities. Students will create deliverables throughout the semester that will form a personal brand portfolio designed to showcase their talents and skills in communication. This course is designed for students who are provisional or have obtained advisor approval.

480.605 Organizational Communication
This course explores the complexities and strategies of internal and external communication in public, private, and non-profit organizations. As a leadership tool, communication serves a political, informational, symbolic and influential function. Organizational theory and research are core components of this course. Specifically, this course equips students to critique and develop the fundamentals of: vision and mission statements, strategic plans, white papers, annual reports, crisis communication, and marketing and promotional communication.

480.622 Branding by Motion Picture
Branding by Motion Picture is a course for those who want to use the motion picture medium to promote brands. It's a writing course, not a production course, on the art of expressing a brand in linear form—as a 30-second commercial for television and the Web or a longer branding video for the Web. When we say the Web we mean Web 2.0, which came about in the early 2000s and made it possible to share motion picture—in this case, digital video—with other users. The advent of Web 2.0 meant then—and still means—that almost anyone can use the Web to brand by motion picture. Production costs have tumbled—another benefit of galloping technology. But you do need the understanding and the tools that have traditionally belonged to a small cadre of creatives in advertising agencies. Branding by Motion Picture shares one thing the creatives know that the rest of us don't. They know that when you're talking motion picture, you're not reaching out to consumers—you're reaching out to audiences. And audiences, despite their demographic and psychographic differences, all want to be entertained. People want to be told a good story. In a sense, nothing has changed since the Cro-Magnon campfire. We study branding videos and commercials for what they can teach us about brands, brand dynamics, audience needs and watchability. Most of all, we look at good storytelling. If the brand is the wool and the movie the yarn, the job of spinning the brand into a good yarn is not always straightforward or even logical. We search for method in the creative madness. There are no textbooks, only videos we watch, read about in the advertising press, and dissect. Students are invited to share interesting and provocative examples of work they find on the Web—including commercials. Branding by Motion Picture is a practical course. We give students the experience of "doing the creative"—developing brands and writing scripts to promote them. Written assignments take the form of creative briefs and original scripts for brands selected by the students themselves. While students may go on to have their scripts produced through the organizations they work
for, Branding by Motion Picture stops short of this stage in
the process. Understanding brands and their expression in the
motion picture medium, understanding the grammar of film
(the word “film” has lost most of its literal application, but the
grammar hasn’t gone away)—these few things are more than
enough for a 13-week course.

480.623 Political Communication Campaigns
This course will cover the final few months of the 2012
campaign for President of the United States. As much as
possible, the class will use actual events in the campaign as
the basis for assignments and class discussions. Students
will react to actual situations as if they were working for one
of the candidates to prepare such campaign communication
tools as news releases, talking points, op-eds, candidate or
surrogate speeches and radio or television commercials.
Students will also learn about campaign strategic planning and
message development. The final weeks of the class will focus
on analysis, such as the role played by the news media in the
result, if any, and any other external factors that might have
affected the outcome. The class will expose students to the
practical applications of the communication process as used
in contemporary political campaigns, including the use of new
technologies and social media. Students will also learn about the
operation of a political press office and the duties of a political
press secretary, media advisor or communication director, and
the news media professionals who cover them.

480.624 Press Secretary: Theory & Practice
This class uses current events and interactive discussions to
focus on the skills required to be an effective press secretary
and communications advisor. It examines the roles, duties and
responsibilities of press secretaries in a variety of settings: on
Capitol Hill, in federal agencies, the White House, industry
associations, non-profits, advocacy organizations, and political
campaigns. The course includes engaging guest lectures that
share insight from journalists, press secretaries, and
communications professionals in the field about effective
techniques and lessons learned. Students engage in real-time
exercises that deal with typical situations that a press secretary
faces in the course of a day, and participate in discussions on the
complex environments in which a press secretary works. By the
end of the course, students will be able to draft and distribute
materials such as media strategy memos, press releases, talking
points, and to plan a press conference.

480.629 Public Relations in the Age of Digital Influence
Marketing and communication are changing. The levers that
we have pulled for years to sell products and services, change
behaviors, and advocate for causes no longer work the way they
did. As trust in media and marketing plummets, trust in our
peers, friends, family, and colleagues rises. Today we recognize
new influencers in the people sitting next to us. Now, creating
a conversation is just as important as driving media, forming
partnerships and crafting messages. Call it influencer marketing
or brand stewardship in the network age. It’s all public relations.
This class covers how to create comprehensive digital-influence
strategies and ultimately how to be an effective public relations
professional in this new digital age.

480.630 Multimedia Authoring
This course is an introduction to techniques for reading, writing,
analyzing, producing and publishing integrated forms of digital
multimedia. Students will be assigned projects that explore
the aesthetic, technological and communications concerns
inherent in new media production for the online medium. The
course emphasizes the understanding of key paradigms of the
multimedia experience, including: integration, interactivity,
hypermmedia, and immersion essential to the construction of
narrative forms specific to digital media. Production techniques
and design strategies will be introduced for incorporating text,
imagery, sound, and video into Web 2.0 applications such as
blogs, Twitter, Facebook, YouTube, etc. Readings will explore key
issues in contemporary media and communications impacted
by new and emerging digital technologies. The objective of the
course is for students to learn the practical and critical skills
necessary to achieve digital fluency for their professional work
in the field of communication. This course was formerly called
Essential Skills in Digital Media Literacy.

480.631 Effective Web Design and Strategy
Having a website in the 21st century is a no-brainer, but
developing a website that really works is no small task. This
class prepares students to analyze the critical communication
considerations that drive the strategy of successful websites,
and provides them with the knowledge and vocabulary to
structure, define and lead the development of sophisticated and
effective web-based communications platforms. From audience
definition and content strategy, through usability testing,
information architecture, technologies, design and search
engine optimization, students will learn how to define, design,
and deploy smart sites that succeed—communicate—across
divergent audiences, brands and businesses.

480.632 Digital Political Strategy
No president will ever be elected again without an internet
strategy. Mobile phones and Facebook are being used to
organize mass protests. Thanks to YouTube, two Senators lost
elections, and bloggers took down former CBS anchor Dan
Rather and former Senate Majority Leader Trent Lott. Clearly,
the world of political and issue campaigns has changed in
the digital age. In this course students explore new strategies
possible in a networked world and learn what it takes to be a
digital political strategist.

480.633 Interactive Marketing and Advertising
This is a hands-on course that focuses on the creative process,
design and development of interactive marketing and
advertising campaigns for online and mobile environments.
Defining the audience, understanding the user experience
and empowering the consumer are key to creating effective
campaigns in this constantly changing environment. Standards,
guidelines and best practices for creating display advertising
and rich media will be taught, along with viral, word-of-mouth
and emerging technologies. Practical skills will be taught as
well, and by the end of the course students will produce an
integrated interactive campaign.

480.634 Journalism & Publishing in the Digital Age
Publishing and journalism were once separate domains, but the
internet and new media have radically changed that. The rise of so-called civic journalism and the ease of “publishing to the ‘net” raise pressing questions such as who is a journalist, and what does it mean nowadays to “publish” something. Is print dead? Is Google making us stupid? Will the iPad save publishing? Through lectures, readings, discussions and individual projects, this research seminar will attempt to answer such questions. We’ll also examine recent or ongoing controversies such as Wikileaks and the Google book project. We’ll explore the impact of new media (e.g., citizen journalism, social networking sites, online video, and mobile technologies) on both the publishing industry and the practice of journalism, and what the new media environment implies for communications professionals.

480.635 Communication.org: Not-for-Profits in the Digital Age
Students examine the primary reasons non-profit organizations exist, and the unique communication challenges they face in reaching their audiences and motivating their desired behaviors. They will examine leading trends in 21st century communication, and assess how non-profit communicators can capitalize on these trends for the benefit of their organizations. Finally, they will devise practical solutions to one or more of a non-profit “client’s” challenges, using one or more of a wide variety of communication tools offered in the current media landscape.

480.636 Web Writing and Content Strategy
You have 3.5 seconds to capture a web visitor’s attention. How do you make sure your website entices them to stick around and learn more? This course examines how compelling web content is essential to engaging visitors and driving their behavior. We’ll explore writing styles appropriate for B2B and B2C websites and blogs, and work with a variety of content formats, such as videos, infographics, contests, polls, and more. Using the website as the hub for content, we’ll cover techniques for driving web visitors to your site with inbound and outbound content marketing strategies. We’ll discuss the intersection of search engine optimization, social media and content marketing and the importance of an integrated approach to content creation and distribution. Lectures and exercises draw on real-world examples from a variety of industries. By the end of the semester, students will be able to create and execute a comprehensive content marketing program.

480.637 Using Social and Digital Media
In this class students learn about 12 useful social media tools, including blogging, Twitter, social networking, podcasting, online video and Digg. More importantly, students apply what they learn by developing a social media plan for a company or organization that they choose. They will be the student’s “Client.” Each week, students learn how to use a different social media tool to engage in conversations that help to tell their client’s story. Students also learn the theories behind why social and digital media is fundamentally changing the way that customers, advocates and engaged consumers are interacting with brands. By the end of semester, students will be able to not just answer, but inspire, the inevitable questions being raised in every organization today: Why should we care about social media? How is it changing the way individuals and organizations communicate? Where should we begin?

Note: Prior to fall 2009 this course was taught under the title Introduction to the Digital Age. Students who took that course may not register for this class as the content is the same.

480.638 Utilizing Images: Media Literacy in Practice
This course will teach you how to critically evaluate media, create effective visual communication by identifying key elements of a visual message, and apply relevant theory as it relates to visual message design. This course provides an overview of the approaches and strategies communication practitioners use to incorporate media literacy in their practices. This course will address the following questions: What is media literacy and how does it relate to visual communication? How can visual media be used effectively to promote strategic messages or positive change? How can we critically evaluate the quality of visual messages and create effective and ethical visual communication?

480.642 Corporate Social Responsibility Campaigns
The Corporate Social Responsibility (CSR) movement is a world-wide phenomenon, and corporations, trade associations and nonprofits are being asked to step up and be accountable. Public relations and communication professionals need to develop the skills to prepare strategic communication plans that reflect their organization’s commitment to CSR in order to protect and enhance their employer’s reputation in the marketplace. This course examines the global CSR movement, explores the communication challenges it presents and offers practical suggestions and tactics to respond to this trend. The class features in-class activities, outside research and guest speakers from NGOs, communication firms, and major corporations with practical advice on meeting this challenge in the global marketplace.

480.643 Branding and Advertising
Branding and advertising are major components of any business or non-profit organization. Showcasing products and services in creative ways increases visibility and improves sales. This course teaches students how to develop brands, create concepts and develop advertising campaigns. Students also learn practical tips including how to organize a creative department, write a creative brief, create budgets and time-lines, research and purchase visual imagery, and how to determine appropriate media for particular branding and advertising campaigns.

480.645 Health Literacy, Language and Culture
This course offers a skills-oriented approach to addressing literacy, language and culture within a health care context. Understanding the relationship between literacy, language and culture will benefit those in health communication, as well as professionals in areas such as public and media relations, digital communication, political communication, and corporate and non-profit communication. Students will explore how low literacy and poor health literacy affect quality and outcomes at the individual and systems level and consider the integration of health literacy, cultural competency and language assistance strategies to reduce disparities in health and well being. Overall, this 13-week course aims to improve the cultural and health literacy competency of professionals and the systems in which they work.
480.646 Managerial Communication
Writer and historian James Humes said, “The art of communication is the language of leadership.” It is that simple comment that forms the foundation of this course. Here students explore the role of communication with stakeholders including subordinates, superiors, internal and external customers, suppliers and the community. Students examine effective communication in hiring and promoting, in conflict, in community interaction and in the internal communication of an organization. The class is built around three precepts or questions: With whom does one communicate, what does one communicate and how does one communicate effectively?

480.651 Sports Branding and Marketing
Sports, in all facets, are engrained in our society. The culture of sports has a profound impact on how we work, live and play. It can create cultural symbols and define cultural aspirations. At the simplest level, it provides an escape from routine and allows for emotional, mental and physical challenges not found in daily life. This course covers career opportunities in Sports Communication. It is intended to enlighten students on how communication professionals can leverage sports culture not only to build brand awareness for sports organizations, but also to gain positive brand association and momentum for companies and products whose identities are linked to sports. Students will look at different levels of sports, from international to local grass roots, and learn what communication strategies and tools can effectively market and advance the overall brand.

480.653 Communicating for Social Change
How do professionals in the nonprofit/government/issue-oriented world determine what messages will help their cause? Students in this skills-based course will work in teams to take on an issue and learn to make a difference. Students will learn a step-by-step process (Audience-based Communication) that many find so useful they immediately apply it to their professional settings or practicums and long after. This process shows how to determine the best role for communication and target the right audience segment. It also teaches how to determine what audience behavior change is needed to make a difference. Unlike for-profits campaigns typically focused on sales, it is often unclear what we actually need the audience to do to create social change. Students will learn how to motivate the audience, to create social brands that break through the clutter and to reach the audience when they can act. Examples are based on real world experiences and address some of the challenges involved in working in the nonprofit space.

480.654 Strategic Communication Program Management
This course covers strategic leadership and communication program development, management and evaluation. It emphasizes basic communication research, strategic communication objectives and message design, selection of media, development of materials, management of teams and impact evaluation. Crisis and issues management as well as the use of new communication technologies are also covered. The course focuses on a step-by-step design of a communication program using the highly acclaimed SCOPE (Strategic Communication Planning and Evaluation) Web learning and planning software. Students develop two strategic communication programs, one as individual work and another as part of a team. Lectures and discussions utilize case studies to illustrate key points and desired learning. This course combines reality-based and conceptual approaches to provide students with the intellectual tools needed to assume senior management or outside counsel roles in developing and implementing fully integrated communication programs.

480.657 Introduction to Public Relations
The Bureau of Labor Statistics lists public relations as one of the fastest growing professions in the United States. This introductory course, designed for career changers and those new to public relations, details the ideas, skills, and principles that underlie the public relations craft. Students in this class study the role and contributions of public relations practitioners in contemporary society, learn about potential legal and ethical aspects of the practice of public relations, study the communication process and how persuasion is used with various audiences, and learn how to develop a strategic communication plan to achieve specific goals and objectives. The class will also introduce students to specialized practice areas within the public relations field such as business and industry, government, nonprofit and associations, and health care.

480.658 Public Relations Writing
The primary goal of this course is for students to develop the professional-level persuasive writing skills expected of the best PR practitioners. Students are given weekly writing assignments outside of class and write on deadline during many class periods. The course covers various forms of public relations writing including press releases, op-ed essays, crisis communications and internal communications. Written work is judged using 10 tenets of good writing: organization, persuasion, clarity, focus, flow, tone, proper usage, timeliness, accuracy and relevance.

480.659 Crisis Communication
This course provides students with a fundamental understanding of crisis management, risk communication, media relations, and public-opinion research techniques in multiple contexts. It introduces students to crisis management principles, strategies, tactics and communication methods. Course participants work as a team to develop a crisis management plan for analysis and discussion. Successful students are able to transfer to the workplace the knowledge and skills developed in this course. Students learn to predict, manage, and control real-world controversies that they may confront as they pursue their careers. Moreover, students are able to manage effectively, participate in, and control volatile situations involving the news media.

480.660 Media Relations
Media outreach is a critical piece of any strategic communication effort. This course prepares students to build, implement, and measure earned media programs that achieve policy, business and philanthropic objectives. Class lectures, guest speakers, readings and assignments give students an understanding of the priorities and expectations of various
types of contemporary media, and how to successfully engage them through research-based strategies and tactics designed to reach key audiences.

480.661  International Public Relations and Public Diplomacy
In today's global world, reaching international audiences is a key function of U.S. government-funded public diplomacy programs, corporate public relations, and non-governmental organizations involved in relief and development. Through readings, lectures, discussions and exercises, this course examines the differences between domestic and international media environments. Students develop communication skills needed to deliver messages and craft outreach strategies and programs for non-American audiences. Special attention is paid to communicating with audiences in Africa, Latin America and Southeast Asia, including Afghanistan, Pakistan and India. Topics include a historical overview of international public relations and public diplomacy, opportunities and challenges for today's public diplomacy practitioner, using research to understand international audiences, writing effectively for international audiences, health and development communication, and communication in international conflict resolution. Students emerge with skills to work overseas in the fast-growing areas of public diplomacy and international public relations.

480.662  Opinion Writing
The world of Washington revolves around opinion, and access to the nation's editorial and op-ed pages is key to making sure your opinions (or those of your employer) are successfully shared with the policy makers and opinion leaders who shape public policy. Opinion pieces carry far more impact than news; consequently, the editorial and op-ed pages are much more difficult markets to crack than the news pages. The editorial and op-ed pages have their own writing style and standards of news judgment; once a writer knows them, though, opinion writing is some of the most rewarding journalism, personally and professionally. Students in this class learn to understand the anatomy of good editorial writing; how to write for opinion sections of newspapers, magazines, and other news outlets; how to pitch op-ed and opinion pieces; and how to sell ideas to editorial boards.

480.663  Integrated Marketing Communication
Integrated marketing communication breaks down the traditional advertising, public relations and marketing silos by challenging practitioners to apply the optimum mix of media and message to motivate the target audience to act. The rise of the internet and now Web 2.0 support the need to embrace integrated marketing communication as a comprehensive approach to reach target audiences. In this course students learn to evaluate audience demographics and apply the appropriate communication channels and messages based upon the audiences' needs and the business realities of marketing campaigns. During the semester, students develop a tool kit of steps to follow to attain marketing success. Through simulation exercises, case study analysis and self-directed reading, students develop a results-oriented and measurable marketing campaign proposal.

480.665  Speech Writing
Speech writing is one of the most important but least instructed skills for Washington professionals. Through hands-on practice, students learn to write speeches for diverse clients, occasions and contexts including corporate and political speeches, keynote addresses, Congressional testimony, as well as informal remarks such as eulogies and toasts and how to coach speakers for more effective delivery. The course integrates speech writing with public relations skills in areas such as campaign messaging, investor relations and crisis management.

480.668  Understanding Markets and Audiences
This course demonstrates the important role market research—and the use of existing data to better understand audience and environment—plays in the overall campaign process. This course will focus on the integral steps that facilitate target audience definition and how to extract a keen understanding of this audience and its interactions within its environment to develop effective campaign strategy. The course's structure and various assignments will often mimic a client/consultant relationship to ensure a real-world experience. To that end, the instructors will play the role of "client" in many instances, asking students to articulate how an assignment or deliverable contributes to the overall goals of the campaign.

480.669  Emergency & Risk Communication
Emergency and risk communication are an emerging set of practices that convey credible, accurate and real-time information about adverse events and the degree of risk they pose. In a post-Katrina, post-9/11 environment, communication professionals must be familiar with best practices in emergency and risk communication to effectively work with government, industry, the media, and the general public during crises and longer-term threats involving health, safety, security, and the environment. In this course, students become familiar with the core principles of emergency and risk communications and risk perception and have an opportunity to apply strategic communication approaches to real-world risk scenarios. Students learn to apply strategic communication approaches used in emergency preparedness, environmental health, food security, national security and financial security.

480.670  Law for Communication Professionals
Communication professionals encounter the law in many ways. They need to know what they can put on a website, what they can say about private citizens and public figures, what they have to say in political commercials, and what claims they can make about products they advertise. This course explores the laws communication professionals need to know about to do their job effectively. Students will learn how to evaluate slander, libel and defamation issues. Copyright, trademark and privacy law will be addressed, including the "fair use" right to excerpt materials on and off the Internet. First Amendment issues to be covered include regulation of advertising and other government regulation of speech, as well as its impact on the rights of parents and children. Campaign finance issues will also be considered, including "equal time", independent expenditures and candidates' speech rights. The course also covers issues raised by broadband deployment, including spectrum management and "open internet" issues.
480.671 Government Relations and Lobbying
This course introduces students to the practical applications of federal lobbying and governmental relations. Through discussion, reading, guest lectures and actual site visits, students gain valuable applied knowledge in the communication tactics of this influential business. The course is designed to teach the students a “how to” approach, with specific focus on successfully communicating with governmental officials, designing lobbying campaigns and reviewing the foundations of governmental representation. This class conducts a detailed study of the structure of our government, ethical standards, influence methods, cultural appreciation, and the specific communication skills necessary for all advocacy professionals. The class explores various political and applied principals that are needed in practicing governmental representation. The course also gives students a practical understanding and unusual knowledge of the art of lobbying.

480.672 Polling for Strategic Communication
Polling is more than a snapshot of who is winning and who is losing. Effective analysis is important for any campaign whether one’s object is to elect a candidate for office, position a company or product or advance an issue. This class concentrates on teaching students the best practices for designing, writing and conducting polls, and how to use the results to formulate a successful communication strategy. Students critique existing opinion surveys and learn how to read and interpret polls, including those used in political and health campaigns and by corporations and other issue organizations.

480.675 Public Policy Management & Advocacy
Washington D.C. is home to thousands of organizations attempting to influence public policy. Associations, foundations, think tanks and private lobbying firms are all competing for the attention of policymakers and the public. These groups invariably need competent communicators who can help them cut through jargon, crystallize their messages and strategically communicate with the key audiences imperative to advancing their policy goals. This course introduces students to the deliberate process organizations undertake to speak out on issues and exert influence over the policies that have the potential to impact them and the way they do business. The class will cover how organizations conduct advocacy efforts and how communication is used as a tool to advance policy change.

Students will gain a practical understanding of how policy groups and communications professionals operate in the field.

480.677 Grassroots Communications
Grassroots communication is critical for candidates and for causes. This course explores how grassroots political communication differs from other types of communication, when and where it’s effective, and how to build an effective strategy and plan. Students discuss how grassroots communication links to the rest of the communication plan, which messages are best suited to it, and how it can be leveraged to benefit other activities. The data are rich, the anecdotes are informative, and the potential of grassroots political organizing is immense.

480.678 Spokesperson Development & Training
This course provides students with the knowledge and skills necessary to perform effectively as spokespersons in news media interviews and other high-stakes situations requiring public testimony. Students learn what motivates news media and how journalists cover stories. They learn to recognize the numerous interview techniques used by reporters, and the major differences between broadcast and print interviews. Course participants also learn successful spokesperson strategies, tactics and techniques designed to enhance their performance and reduce the risks inherent in today’s volatile media environment. Students develop effective messages and the other tools needed to prepare for interviews and public communication differs from other types of communication, testimony. Students use on-camera training throughout the course to sharpen interview skills and to critique student performance. Successful students are able to transfer the knowledge and skills acquired in this course to the workplace. They are prepared to serve as spokespersons in a wide array of situations ranging from routine news interviews to potentially volatile confrontations.

480.681 Communication Evaluation
This course will prepare communication researchers to gather evidence that guides the planning, implementation, and refinement of communication campaigns. Throughout the semester, students will practice using evaluation to inform the various stages of a communication effort based on real world conditions. They will draw from behavior theory; and formative (including pretesting), process, and summative evaluation. They also will learn how to ensure the protection of the rights of human research participants.

480.682 Health Psychology & Behavior Change
This course provides an overview of health psychology: the scientific study of behaviors and cognitive processes related to health states. It addresses the mind/body connection, the influence of social and physical environments on our health, cognitive processing of health information, health belief models, and the link between personality traits and health. Understanding the interactions between these biological, psychological, and social influences on individuals' health states is a key element in developing effective health communication and intervention programs. Students approach all course topics from both theory-driven and applied perspectives.

480.686 Behavior Change and Education through Entertainment
This course explores the various ways communication professionals can use entertainment to educate people and encourage them to adopt and enjoy improved life styles. Throughout history, stories, drama, poetry, music, dance, and other entertainment formats have been used to enlighten and educate both adults and children. In today’s society, the channels of communication are ever increasing. This course investigates ways in which education can be subtly but effectively worked into both new and time-honored genres of entertainment to foster positive behavior change.
480.687  Intercultural Communication
This course examines the meaning and importance of intercultural communication as it applies to individuals, groups, organizations and nations. Students examine the meaning of “culture” and how “culture” can affect personal, national and international understanding and communication, beliefs and behaviors. The course examines the difficulties and dangers that can result from cultural misunderstanding. In a modern world with diverse communication methods, there is an ever-increasing need for intercultural understanding and communication. The course investigates the various ways in which cultures differ and the necessity of understanding and respecting other cultures. The course assists communication professionals to be more effective with external communication campaigns in other countries and internal communication within a diverse workplace. The course emphasizes clear and logical spoken and written expression to enhance individual ability to interact effectively with people of different cultures.
Post-Baccalaureate Certificate in Applied Research in Communication

advanced.jhu.edu/appliedresearch

The Post-Baccalaureate Certificate in Applied Research for Communication is for students who are working in or pursuing a wide variety of jobs. For example, a Vice President of Strategic Planning and Research at a public relations firm may manage studies that help communication clients identify target audiences, set campaign objectives, create messages, and identify channels. A Market Research Director at a trade association may oversee research for brand, product, and business development as well as marketing, advertising, and social media evaluation. A Senior Behavioral Scientist at a federal health agency may lead formative, process, and summative evaluation to plan and refine health communication and social marketing campaigns. A Lead Policy Analyst at an advocacy firm may supervise studies that guide communication about lobbying policy and reform. A Research Manager at a corporation may collect data, draw insights, and make recommendations that work toward business objectives. Students and alumni have access to our exclusive job opportunities network and Career Services Center.

Read more about the Post-Baccalaureate Certificate in Applied Research for Communication program and start an application online at advanced.jhu.edu/appliedresearch or contact us at 202.663.5776.

CERTIFICATE

The Post-Baccalaureate Certificate in Applied Research for Communication requires five courses. Students can enroll part-time and thus earn the certificate within 1 year or take up to 5 years.

APPLICATION

Individuals who wish to apply for the Post-Baccalaureate Certificate in Applied Research for Communication program must do so through the Advanced Academic Programs. (The Admissions Committee reserves the right to request additional information from applicants, if needed, to assess their candidacy for admission. All application materials submitted to the Advanced Academic Programs become the property of the Johns Hopkins University and will not be returned to applicants under any circumstances.)

Prerequisites

Prospective students must hold a bachelor’s degree with a minimum grade point of average (GPA) of 3.00 prior to enrolling in the Post-Baccalaureate Certificate in Applied Research for Communication program.

PROGRAM COMMITTEE

Brad Leithauser | Program Chair
Memi Miscally | Program Director
Susan Allen | Assistant Director
Elizabeth Patton | Program Coordinator

Application Requirements

> AAP application.
> Nonrefundable application fee.
> Resume: Include any part- or full-time work, internships, and volunteer history. Detail any responsibilities related to communication and research.
> Statement of purpose: Explain why you are interested in earning the Post-Baccalaureate Certificate in Applied Research for Communication and how it will help your career. Double space your essay and limit it to 500 words or less (place the word count at the end of the document).
> Writing sample: Please go to the online application to download instructions and an article for your writing sample. This exercise asks you to write a single, brief paragraph. It should not take the form of a larger document, such as a letter, an email, a report, or a plan. Submit one paragraph with no more than 250 words.
> Two recommendations: Professors or supervisors should verify academic and professional accomplishments. The department prefers that they complete the AAP recommendation form rather than provide a letter.
> Official transcripts: They should show all undergraduate and graduate coursework completed within the U.S. only. (We accept official transcripts sent electronically through Scrip-Safe or Docufide, or in sealed institutional envelopes. If a transcript comes in a sealed envelope, it must be dated within the past three months.)
> GRE scores, if necessary: The program waives this requirement for applicants who have (a) a cumulative undergraduate GPA of 3.0 or higher or (b) five or more years of full-time work experience after earning an undergraduate degree. Submit results directly to the Advanced Academic Programs Office of Admissions, using the code 8747. Photocopies will not be accepted.
International Students

- Foreign credential evaluation: Students who earned their post-secondary degree(s) in a country other than the U.S. are required to have a "course-by-course" credential evaluation with GPA performed by an outside evaluation service. Study abroad may be exempt.

- TOEFL or IELTS scores: International students who have not graduated from an accredited college or university in the U.S. and whose native language is not English must take the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS). Submit results directly to the Advanced Academic Programs Office of Admissions, using the code 8747. Photocopies will not be accepted. For the TOEFL, AAP requires a minimum score of 600 on the paper test, 250 on the computer-based test, and 100 on the Internet-based test. AAP requires an IELTS bandscore of 7.0.

Student Status

At the time of admission, students fall under one of the following statuses: degree or conditional. Degree candidates fulfill all academic requirements at the time of application. Conditional students are in their last semester of undergraduate study at the time of application and must submit an official transcript verifying degree conferral prior to registering for their second semester.

Student Visas

The Post-Baccalaureate Certificate in Applied Research for Communication is part-time and online, thus international students cannot request certification for an F1 visa.

CURRICULUM

The Post-Baccalaureate Certificate in Applied Research for Communication will help students acquire the knowledge and skills necessary to achieve the following learning outcomes:

1. Assess the research needs of a communication effort
2. Design theory-based formative, process, and summative evaluation studies.
3. Execute quantitative and qualitative methods.
4. Analyze data using thematic, descriptive, and inferential approaches.
5. Use results to plan and refine communication efforts.

Students must take a total of 5 courses. All are online. The courses are a mix of required, core, and elective.

Required Courses

One of the five courses is required. Students who earn a C or below in a required course must repeat that course. The required is as follows:

480.600 Research and Writing Methods: Students must complete this course during their first semester and before enrolling in any core courses.

Core Courses

Three of the five courses are cores. Students who earn a C or below in a core course may not count that course toward core requirements. The cores are as follows:

480.608 Applied Quantitative Research: Students can complete this course during their second through last semesters.

480.609 Applied Qualitative Research: Students can complete this course during their second through last semesters.

480.804 Practicum: Students must take either 480.608 Applied Quantitative Research or 480.609 Applied Qualitative Research before enrolling in 480.804 Practicum, which they must complete during their last semester. During 480.804 Practicum, students conduct a real-world study; if it involves human subjects, the study must obtain Homewood Institutional Review Board approval before the start of participant recruitment and data collection.

Electives

One of the five courses is an elective. It is as follows:

480.681 Communication Evaluation: Students can complete this course during their first through last semesters.

Students who start the Post-Baccalaureate Certificate in Applied Research for Communication program can switch to the Master of Arts in Communication program. Moreover, they can apply all of their certificate courses toward the master’s degree. To learn more about the MA in Communication, go to communication.jhu.edu.

COURSE DESCRIPTIONS

Required Courses

480.600 Research and Writing Methods

Communication professionals take on diverse and multiple roles within and across organizations, but they share one role in common as strategic problem solvers. This course will teach you how to find, read, interpret, evaluate, and apply scientific research studies to solve practical problems encountered by communication practitioners. Topics covered include how to effectively use library resources to find research that can be of strategic value; how different research methods, including focus groups, case studies, surveys, and experiments are used in communication research; how to evaluate the quality of research reports; how to interpret qualitative and quantitative findings, including statistics; and how to distill the information found in research reports down to what is most relevant and usable. In addition to learning how to become a competent and critical research consumer, you will also be exposed to current research across different areas of the communication discipline.
Core Courses

480.608 Applied Quantitative Research
This hands-on course guides students through the various types of quantitative research they may need to perform on the job, such as, analyzing an audience, testing a message, doing a media audit, or demonstrating the effectiveness of a department. Students learn how to develop and design good surveys, experiments, and quantitative content analyses, and how to run basic statistics on their data including the following: chi-square, t-test, and correlation. Students also learn how to write up and present the results of their research. Students should take this course prior to the semester in which they begin their research for Thesis or Practicum. Prerequisite: Research and Writing Methods.

480.609 Applied Qualitative Research
Communication professionals use qualitative methods to craft messages that resonate with audiences. This hands-on class exposes students to qualitative research methods that can be used on the job to guide communication efforts more strategically. Students learn how to design and conduct studies to gain insight into audience perceptions on a variety of issues. Specific techniques covered include in-depth interviews, focus groups, qualitative content analyses, and case studies. Through applied activities, students learn how to collect, analyze, and present qualitative research data. Students should take this course prior to the semester in which they begin their research for Thesis or Practicum. Prerequisite: Research and Writing Methods.

480.804 Practicum
Strategic-planning students complete the Practicum course during their last semester. This optional core course offers a culminating experience that helps students integrate new or enhanced capabilities into a significant evidence-based project relevant to their profession. Each student can identify an organization or individual in need of support for a communication-related project and how to fulfill that need. In addition, the student must prepare (a) a proposal that outlines objectives, scope of work, any deliverables, timeline, and method for evaluating achievement of objectives; and (b) any final deliverables. The student must complete the Practicum course in one semester.

Elective Course

480.681 Communication Evaluation
This course will prepare communication researchers to gather evidence that guides the planning, implementation, and refinement of communication campaigns. Throughout the semester, students will practice using evaluation to inform the various stages of a communication effort based on real world conditions. They will draw from behavior theory, and formative (including pretesting), process, and summative evaluation. They also will learn how to ensure the protection of the rights of human research participants.
Leaders in business and industry recognize the importance of communication, but few MBA programs offer communication courses. At the same time, communication professionals recognize the importance of good business practices, but programs rarely offer courses in business. The Master of Arts in Communication/Master of Business Administration dual degree program was developed to fill that need. It helps advance the careers of managers in public and media relations, advertising, crisis communication, organizational development, and risk communication. Students and alumni have access to our exclusive job opportunities network and Career Services Center.

DEGREE

Dual Master of Arts in Communication and Master of Business Administration

The university allows students to simultaneously pursue a Master of Arts in Communication in the School of Arts and Sciences and a Master of Business Administration at the Carey School. To pursue these dual degrees, students must apply and be accepted to both programs. Students who successfully complete the requirements for both degrees will receive two separate degrees. Students may complete one degree first and be awarded the diploma before continuing with the second degree or strive toward both degrees concurrently. Pending graduates must complete the graduation application for each school.

Dual degree students may participate in both commencement exercises.

APPLICATION

Individuals who wish to apply for the dual MA in Communication/MBA program must apply through the Advanced Academic Programs (AAP). They can apply to both programs concurrently or they can start with one program and then apply for the dual degree by submitting an application to the second program through the AAP Admissions Office. The MA in Communication program will consider applicants for the MA in Communication portion of the degree, while the MBA program will consider applicants for the MBA portion of the degree. An individual can be accepted by one rather than both programs; in this case, that person can decide whether to enroll in the single program. (The Admissions Committees reserve the right to request additional information from applicants, if needed, to assess their candidacy for admission. All application materials submitted to the Advanced Academic Programs become the property of the Johns Hopkins University and will not be returned to applicants under any circumstances.)

Prerequisites

Prospective students must hold a bachelors degree with a minimum grade point average (GPA) of 3.00 prior to enrolling in the MA in Communication/MBA program.

Application Requirements

All Students

> AAP application.
> Nonrefundable application fee.
> Resume: Include any part- or full-time work, internship, and volunteer history. Detail any responsibilities related to communication or business.
> Statement of purpose: Explain why you are interested in earning the dual MA in Communication/MBA and how it will help your career. Double space your essay and limit it to 500 words or less (place the word count at the end of the document).
> Writing sample: Please go to the online application to download instructions and an article for your writing sample. This exercise asks you to write a single, brief paragraph. It should not take the form of a larger document, such as a letter, an email, a report, or a plan. Submit one paragraph with no more than 250 words.
> Two recommendations: Professors or supervisors should verify academic and professional accomplishments. The departments prefer that they complete the AAP recommendation form rather than provide a letter.
> Official transcripts: They should show all undergraduate and graduate coursework completed within the U.S. only. (We accept official transcripts sent electronically through Scrip-Safe or Docufide, or in sealed institutional envelopes. If a transcript comes in a sealed envelope, it must be dated within the past three months.)

> The MA in Communication and MBA programs have different requirements for GRE or GMAT scores:

The MA in Communication program may require GRE scores. The program waives this requirement for applicants who have (a) a cumulative undergraduate GPA of 3.0 or higher or (b) five or more years of full-time work experience after earning an undergraduate degree. Submit results directly to the Advanced Academic Programs Office of Admissions, using the code 8747. Photocopies will not be accepted.

The MBA program may require the GMAT or GRE scores. A waiver from these exams may be approved if a candidate has:

• Completed a graduate degree and can demonstrate quantitative ability through coursework of B or better in Statistics, Corporate Finance or Microeconomics.

• Completed an undergraduate degree and has at least five years professional experience. Applicant has also taken at least one course in Statistics, Corporate Finance and Microeconomics and earned a B or better and earned an overall GPA of 3.0 or better.

• Holds a professional designation such as CPA or CFA.

International Students

> Foreign credential evaluation: Students who earned their post-secondary degree(s) in a country other than the U.S. are required to have a “course-by-course” credential evaluation with GPA performed by an outside evaluation service. Study abroad may be exempt.

> TOEFL or IELTS scores: International students who have not graduated from an accredited college or university in the U.S. and whose native language is not English must take the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS). Submit results directly to the Advanced Academic Programs Office of Admissions, using the code 8747. Photocopies will not be accepted. For the TOEFL, AAP requires a minimum score of 600 on the paper test, 250 on the computer-based test, and 100 on the Internet-based test. AAP requires an IELTS band score of 7.0.

Student Status

At the time of admission into the MA in Communication program, students fall under one of the following statuses: degree, provisional, or conditional. Degree candidates fulfill all academic requirements at the time of application. In contrast, provisional students do not meet the requirements but demonstrate promise toward completing the MA in Communication program; therefore, they must pass a prerequisite course before being able to request a change of status from provisional student to degree candidate. Conditional students are in their last semester of undergraduate study at the time of application and must submit an official transcript verifying degree conferral prior to registering for their second semester.

Student Visas

International students who have been admitted as degree, provisional, or conditional candidates and who take at least three courses per semester, which is full-time classification, may request certification for an F1 visa. Students for whom this may be a possibility should indicate Yes on their admissions application at the appropriate checkbox regarding initiating the visa process. The Admissions Office of the Advanced Academic Programs will assist in the certification process (aapinfo@jhu.edu) which the student must complete with the Office of International Student and Scholar Services.

MA IN COMMUNICATION CURRICULUM

The curriculum of the MA in Communication program portion of the dual degree is the same as that of the MA in Communication program. Refer to the latter’s section of the catalogue for detail.

MBA CURRICULUM

Students must take the following courses. All courses are 2 credits with the exception of Strategic Management.

120.601 Business Communication
121.610 Negotiation
131.601 Leadership Ethics Seminar
132.601 Business Law
142.620 Leadership in Organizations
142.730 Strategic Human Capital
210.620 Accounting and Financial Reporting
220.610 The Firm and the Macroeconomy
220.620 Economics for Decision Making
231.620 Corporate Finance
232.701 Investments
350.620 Information Systems
410.620 Marketing Management
510.601 Statistical Analysis
520.601 Decision Models
680.620 Operations Management

Five (5) Carey Electives
Master of Arts in Communication/Certificate in Nonprofit Management
Combined Program

Professionals with sharpened skills in the social science of communication will be able to apply those skills to mission-driven, nonprofit organizations. Upon graduating from the combined program, individuals will be well prepared to lead their nonprofit employers in designing and implementing communication campaigns that promote reforms in public policy, mobilize constituencies to lobby their elected officials, advance their goals through public and media relations, or change behaviors in ways that improve the health, well-being and public safety of all. Even if students pursue careers in the corporate or public sectors, they are highly likely to interact with nonprofit or nongovernmental organizations or serve on nonprofit boards of directors. All of these roles require an understanding of the impact of nonprofits in the U.S. and other countries, and the principles and challenges of managing them, including what it means to supervise a volunteer work force and raise money through the generosity of others.

DEGREE

Combined Master of Arts in Communication and Certificate in Nonprofit Management

The university allows students to simultaneously pursue a Master of Arts in Communication and Certificate in Nonprofit Management in the School of Arts and Sciences. To enroll in both programs, students must apply and be accepted to both programs. Students who successfully complete the requirements in both programs will receive two separate documents—a Communication diploma and Nonprofit certificate. Students may complete one program first before continuing with the second program or be in both programs concurrently. Pending graduates must complete the graduation application for each school. Students who finish the combined program participate in a single commencement ceremony.

APPLICATION

Individuals who wish to apply for the combined MA in Communication/Certificate in Nonprofit Management program must apply through the Advanced Academic Programs (AAP). They can apply to both programs concurrently or they can start with one program and then apply for the combined program by submitting an application to the second program through the AAP Admissions Office. The MA in Communication program will consider applicants for the MA in Communication portion, while the Certificate in Nonprofit Management program will consider applicants for the Certificate in Nonprofit Management portion. An individual can be accepted by one rather than both programs; in this case, that person can decide whether to enroll in the single program. (The Admissions Committees reserve the right to request additional information from applicants, if needed, to assess their candidacy for admission. All application materials submitted to the Advanced Academic Programs become the property of the Johns Hopkins University and will not be returned to applicants under any circumstances.)

Prerequisites

Bachelor’s degree from a regionally accredited U.S. college or university with a minimum grade point average (GPA) of 3.00 (or the equivalent from outside the U.S.).

Application Requirements

All Students

- AAP application.
- Nonrefundable application fee.
- Resume: Include any part- or full-time work, internship, and volunteer history. Detail any responsibilities related to communication and nonprofit management.
- Statement of Purpose: Explain why you are interested in entering the MA in Communication and Certificate in Nonprofit Management combined program, and how it will help your career or other goals. Double space your essay and limit it to 500 words or fewer (place the word count at the end of the document).
- Writing Sample: Effective for Summer 2015 and beyond, applicants to the MA in Communication program must submit a writing sample. Please click here to download the instructions and article for your writing sample. This exercise asks you to write a single, brief paragraph. It should not take the form of a larger document, such as a letter, an email, a report, or a plan. Submit one paragraph with no more than 250 words.
- Recommendations: Under “Recommendations,” include the contact information for two recommenders. Professors or supervisors should verify academic and professional accomplishments. They will be automatically emailed access information to the system. They can then complete and upload their recommendation form and letter.
- Official transcripts: For U.S. graduates, transcripts should show all undergraduate and graduate coursework completed within the U.S. only. (We accept official
Communication may request certification for an F1 visa. Students for whom this provision is needed must take at least three courses per semester, which is full-time classification, or until fulfilling a prerequisite course before being able to request a change of status from provisional student to degree candidate. Conditional candidates fulfill all academic requirements at the time of application and must submit an official transcript verifying degree conferral prior to registering for their second semester.

The Certificate in Nonprofit Management program does not require GRE scores of anyone.

International Students

GRE Scores: The MA in Communication and Certificate in Nonprofit Management programs have different requirements for GRE scores:

The MA in Communication program may require GRE scores. The program waives this requirement for applicants who have a cumulative undergraduate GPA of 3.0 and higher or at least five years of full-time work experience after completing college. Submit results directly to the Advanced Academic Programs Office of Admissions, using the code 8747. Photocopies will not be accepted.

The Certificate in Nonprofit Management program does not require GRE scores of anyone.

International Students

GRE Scores: The MA in Communication and Certificate in Nonprofit Management programs have different requirements for GRE scores:

The MA in Communication program may require GRE scores. The program waives this requirement for applicants who have a cumulative undergraduate GPA of 3.0 and higher or at least five years of full-time work experience after completing college. Submit results directly to the Advanced Academic Programs Office of Admissions, using the code 8747. Photocopies will not be accepted.

The Certificate in Nonprofit Management program does not require GRE scores of anyone.

Student Status

At the time of admission into the MA in Communication program, students fall under one of the following statuses: degree, provisional, or conditional. Degree candidates fulfill all academic requirements at the time of application. In contrast, provisional students do not meet the requirements but demonstrate promise toward completing the MA in Communication program; therefore, they must pass a prerequisite course before being able to request a change of status from provisional student to degree candidate. Conditional students are in their last semester of undergraduate study at the time of application and must submit an official transcript verifying degree conferral prior to registering for their second semester.

Student Visas

International students who have been admitted as degree, provisional, or conditional candidates and who take at least three courses per semester, which is full-time classification, may request certification for an F1 visa. Students for whom this

may be a possibility should indicate Yes on their admissions application at the appropriate checkbox regarding initiating the visa process. The Admissions Office of the Advanced Academic Programs will assist in the certification process (aapinfo@jhu.edu) which the student must complete with the Office of International Student and Scholar Services.

MA IN COMMUNICATION CURRICULUM

Students must complete 10 courses under the MA in Communication program. Courses are offered at Washington, DC and online. Refer to the MA in Communication section of the catalog to learn more about the program's requirements.

Students must pass 480.600 Research and Writing Methods under the MA in Communication program, before they can start taking courses under the Certificate in Nonprofit Management program.

The combined MA in Communication/Certificate in Nonprofit Management program enables students to reduce their course load. If students were to complete the two programs separately, they would complete a total of 16 courses. Yet students in the combined program take a total of 14 courses, by ensuring that they take the following courses under the MA in Communication program:

480.602 Changing Behavior through Communication, a core course from the Informing Practice through Research group.

At least one of the following electives:

480.635 Communication.org: Not-for-profits in the Digital Age
480.653 Communicating for Social Change
480.654 Strategic Communication Program Management
480.671 Government Relations and Lobbying
480.675 Public Policy Management and Advocacy
480.677 Grassroots Communication

CERTIFICATE IN NONPROFIT MANAGEMENT CURRICULUM

Students must complete four courses under the Certificate in Nonprofit Management program. Courses are offered online.

470.728 Influence and Impact of Nonprofits
470.736 Principles of Nonprofit Management
470.774 Nonprofit Governance and Executive Leadership
470.798 Financial Management and Analysis in Nonprofits
470.623 Nonprofit Program Development and Evaluation
470.625 Resource Development and Marketing in Nonprofits

Refer to the Certificate in Nonprofit Management section of the catalog to learn more about the program's requirements.
Master of Science in Energy Policy and Climate

The MS in Energy Policy and Climate Program will prepare the next generation of interdisciplinary professionals to address the challenges of climate change and a global transition to energy systems.

Graduates will be able to demonstrate an understanding of the science related to a changing climate, the impacts of current and future climate change on natural and human systems, the vulnerabilities of these systems to predicted changes, and a variety of possible legal, policy and technological strategies for mitigation and adaptation. Graduates will also develop a comprehension of energy production, delivery, and consumption for both traditional systems and sustainable/renewable energy alternatives, and the implications of our energy choices for averting dangerous levels of climate change.

The program was originally designed by members of JHU’s Department of Earth and Planetary Sciences of the Krieger School of Arts and Sciences and by industry and policy specialists. Courses are taught by distinguished instructors with valuable experience in the academic, public, corporate and nonprofit sectors.

The program seeks to build in students the technical and management skills needed to become highly competent and ethical professionals, capable of leading societal responses to the challenges of a changing climate and the quest for a revolution in energy production. The curriculum is designed to help students develop an understanding of policy strategies employed at all levels, from the local to the international level, in response to these challenges. Graduates of the program will have an understanding of the current state of the US response to climate change, as well as a familiarity with multilateral agreements and non-US based approaches to both mitigation and adaptation to climate change. Additionally, students will develop expertise in energy production and policymaking.

PROGRAM OBJECTIVES

Graduates will be able to demonstrate:

- Understanding of the scientific principles that explain current and projected changes in climate and the role of humans in this process;
- Knowledge of the impacts of current and future climate change on natural and human systems, the vulnerabilities of these systems to predicted changes, and a variety of possible strategies for adaptation;
- Comprehension of the principles and applications of energy technologies for the mitigation of and adaptation to climate change;
- Business and management skills for designing and implementing carbon-constraint policies and carbon offset structures;
- Understanding of policy options being considered at the local, state and national level, including both regulatory and market-based approaches, for addressing long-term climate change;
- Knowledge of multilateral agreements and non-US based approaches to mitigate and adapt to climate change.

PROGRAM COMMITTEE

Bertrand Garcia-Moreno
Program Chair, Energy, Policy and Climate; Professor and Chair, Department of Biophysics

Antoinette WinklerPrins
Director, Environmental Programs

Daniel S. Zachary
Associate Program Director, Energy Policy and Climate Program

Tom Haine
Morton K. Blaustein Chair and Professor of Earth & Planetary Sciences

Benjamin F. Hobbs
Theodore M. and Kay W. Schad, Professor in Environmental Management

Michael Mehling
Executive Director of the Center for Energy and Environmental Policy Research (CEEPR), Massachusetts Institute of Technology

Cindy Parker
Director, Global Environmental Change and Sustainability Major, Department of Earth and Planetary Sciences

Darryn Waugh
Professor of Earth & Planetary Sciences
ADMISSION REQUIREMENTS

In addition to the materials and credentials required for all programs (see Admission Requirements), the Master of Science in Energy Policy and Climate program requires:

> A grade point average of at least 3.0 on a 4.0 scale in the latter half of undergraduate studies. Work experience or other demonstration of expertise may also be considered in the admissions process;
> One semester of undergraduate calculus and one semester of undergraduate statistics;
> One semester of undergraduate chemistry; and
> It is highly desirable, but not required, that applicants have taken one semester of undergraduate microeconomics.

Students who do not have the necessary undergraduate training in calculus, statistics or chemistry, may be offered provisional admission if their other credentials are strong.

Students who are admitted provisionally due to lack of quantitative skills have the option to:
1. Take appropriate courses at an accredited college/university, or;
2. Take 420.301 Quantitative Methods for Environmental Sciences; or
3. Pass a math placement test, administered by the admissions staff.

Students who are admitted provisionally due to lack of training in chemistry have the option to:
1. Take one semester of general chemistry at an accredited college or university; or
2. Take 420.302 Chemistry of Natural Processes.

Admissions Documents

> AAP application and fee
> A current résumé or CV
> A statement of purpose (500 words) addressing why at this time in your career you want to pursue this graduate degree and why at JHU.
> Two letters of recommendation, preferably including one academic reference
> Official undergraduate and graduate transcripts

Provisional Student

Provisional students are admitted to this status because, in the view of the admissions committee, they do not fulfill all academic requirements for admission as a degree candidate at the time of the application. Provisional students may be required to take specific prerequisite courses, and/or take a specific number of graduate-level courses and complete them successfully in order to establish their eligibility to be admitted as a degree candidate. During the time of this provisional status, students are held to grading criteria stricter than those required of degree candidates (see Grading System, Requirements). Specifics of a provisional admission are outlined in a formal admissions letter mailed to the student. All listed criteria must be met for a student to continue to enroll in courses.

Math Test

Those provisional students who are required to take 420.301 Quantitative Methods for Environmental Sciences (see Prerequisite Courses below), may choose to take a mathematics assessment test. If successfully passed, provisional students will place out of the prerequisite.

This test is administered at the Washington, DC Center at the student's convenience on any working day. After a student is admitted, he/she may make an appointment to take the test and/or to obtain relevant study materials by calling the Admissions Office in Washington at 202.452.1940. An online option is also available, please contact the Admissions Office.

Special Students

Students admitted to the EPC program as special students following the guidelines provided elsewhere in this catalog and by the admissions office, may count no more than 2 courses toward the degree should they apply and be admitted to the program as a degree-seeking student.

PROGRAM REQUIREMENTS

Prerequisite courses

Provisional students who have not fulfilled the required courses for admission are required to complete one or more of the following prerequisites:

420.301 Quantitative Methods for Environmental Sciences
Provisional students may also take appropriate undergraduate level courses at an accredited university, or successfully pass the math assessment test to fulfill this prerequisite. Provisional students should discuss these options with their advisor.

420.302 Chemistry of Natural Processes
Provisional students may also fulfill this prerequisite by taking one semester of general chemistry at an accredited university. Provisional students should discuss these options with their advisor.

Program Coursework

> Four core courses
> Five electives
> Capstone project

For more information about core and elective courses, please see the course descriptions on the following pages. Please note that not all courses are offered every semester, and the Energy Policy and Climate Course Schedule should be consulted for current
classes and times. Core courses are offered at least every other semester.

Electives should be chosen in consultation with the student's advisor and should accommodate individual career goals. Students may also consider taking related courses in other divisions of the graduate program in AAP, including Environmental Sciences and Policy, Geographic Information Systems, Government Studies, or Applied Economics, as well as pertinent courses in other units of the Krieger School of Arts and Sciences, the schools of Engineering, Public Health, Business, Education, or the School of Advanced International Studies (SAIS) (see Registering for Courses in Other Divisions/Programs). Students are permitted, with the written consent of the Associate Director of the program, to take up to two pertinent courses outside of the Energy Policy and Climate curriculum to fulfill their requirements towards the degree.

Please refer to the Advanced Academic Programs Course Schedule for exact dates, times, locations, fees and instructors. Courses are open only to students who meet enrollment requirements.

**CORE COURSES**

The core courses introduce the relevant body of knowledge in science and policy upon which students will base their studies. Some students may have covered most of the material of one or more of the core courses in previous academic work, or through pertinent work experience. Such students should consider requesting that the appropriate core course(s) be waived (see Student Special Requests).

If approved, the waived core course must then be replaced with an additional elective. The core courses can be taken in any order, although it is recommended that students begin with 425.601 Principles and Applications of Energy Technologies. Students must complete fulfillment of the four core courses within the first seven courses in the program towards their degree.

425.601 **Principles and Applications of Energy Technology**

The course examines energy supply and consumption, and how these activities impact the environment, with a focus on understanding the potential technology, market structure and policy implications for climate change. Students will gain a solid understanding of the science, economics, environmental impact associated with various electricity generation technologies, including renewable energy, conventional generation (existing and future), carbon storage and sequestration, and electricity storage. Transportation topics will address a variety of technologies, including hybrids and fuels cells, as well as the potential role for alternative fuels, including biofuels. Climate change and the potential impact and mitigation of carbon dioxide will be considered throughout the course.

425.602 **Science of Climate Change and Its Impact**

The course begins examining the basic processes of the climate system. The course, then, moves to the study of the changing climate. While natural changes will be studied, the emphasis will be on anthropogenic climate change. Various models for predicting future climate change will be presented, including the assumptions and uncertainties embedded in each model. The regional climate impacts and impacts on subsystems will be examined, including changes in rainfall patterns, loss of ice cover and changes in sea level. The possible ecological effects of these predicted changes will also be examined.

425.603 **Climate Change Policy Analysis**

After a study at the historical development of climate change policy, this course analyzes current policy options for mitigating for and adapting to long-term climate change. The course will examine various approaches available in the US for national level policy, including the regulatory approach and the market-based approaches, particularly cap-and-trade and carbon taxation. Various models for designing a cap and trade system will be studied, including the European experience and regional programs in the United States. Special attention will be paid to methods for setting initial prices and accounting for discounts. The course will focus primarily on national level carbon management policies, but international agreements will also be included, as well as equity considerations on a global level.

425.604 **Energy & Climate Finance**

Energy and Climate Finance introduces students to environmental markets and the policies that create them, focusing mainly on emissions trading systems (ETS) to mitigate climate change. The course also provides an introduction to attributes of the financial sector through its analysis of markets for environmental commodities. Students learn the economic theory behind market-based environmental policy instruments such as tradable renewable energy credits, carbon offsets, and water rights in a semester of lectures featuring presentations from practitioners including state and federal government, private companies subject to market-based emissions regulation, commodity brokers and representatives from international institutions.

**ELECTIVES**

Choose five of the following

425.605 **Introduction to Energy Law & Policy**

This course will cover the major types of regulation and market oversight that apply to energy systems. Topics covered will include extraction of oil and gas; siting and regulation of infrastructures; operation and control of the international market for crude oil and products; major environmental regulations that apply to the energy sector; the formulation of legal frameworks to regulate renewable energy sources, and the implications of new climate change and renewable energy mandates for the electric power sector. Most of the course will be empirical, but attention will be given to major theories of market failure as well as theories from political economy that explain when, why, and how governments regulate energy systems, as well as how energy issues are entangled in deeper social and environmental contexts. The focus in this course will be on energy law and policymaking in the United States.
425.623 Transportation Policy in a Carbon-Constrained World
This course examines how transportation decisions and policy can affect climate change, and the transportation solutions available to help solve the problem of climate change. Three sets of policies are examined that can reduce GHGs from the transportation sector—cleaner vehicles, low GHG-emitting fuels and better management of travel demand. Each policy is covered in detail in this course. Prerequisites: Science of Climate Change and Its Impacts, Climate Change Policy Analysis

425.625 Solar Energy: Science, Technology & Policy
This course focuses on the two primary solar technologies in the contemporary market: photovoltaic cells (PV) and concentrated solar power (CSP), with a focus on PV. The course will investigate techniques for increasing efficiency, expanding storage and decreasing price. Solar energy for use as both distributed and grid-independent resources is considered. The course covers science and technologies as well as the environmental impact of solar technologies. Additionally, the course examines the market structure considerations for solar technology development. Prerequisite: Principles and Applications of Energy Technology.

425.626 Alternative Fuels: Science, Technology & Policy
This course will examine the significant proposed alternatives to conventional fuels and discuss the economic and environmental factors associated with the production, distribution, and use of these alternative fuels. Students will learn the technical and systemic barriers to the adoption of alternative fuels. Prerequisite: Principles and Applications of Energy Technology.

425.628 Renewable Energy Project Development and Finance
This course examines the legal and regulatory issues associated with renewable energy projects (wind, solar, geothermal, etc...). Various ownership arrangements and contract agreements for successful development and financing will be examined. The federal and state level regulatory structure governing renewable energy project development and finance will be studied. Prerequisite: Carbon Management and Finance

425.629 Energy Efficiency: Demand Side Options
The focus of this course is reduction of energy use on the demand side with focus on buildings (their structure, design, the contents, e.g., refrigerators, standards, integration) and communities, and to a lesser extent industry technologies (e.g., timber, concrete). The course will also cover general concepts in demand side management and the benefits and implementation of a smart grid system. The course covers both technology and policy of energy efficiency. Prerequisite: Science of Climate Change and Its Impacts, Climate Change Policy Analysis

425.630 Cities and Climate Change
This course looks at the energy demands of cities and potential for alternative energy production in urban context. Local level government climate policy options are also examined, including land use policies, building practices, green infrastructure, city-owned power facilities, local level offsets, and urban-based Clean Development Mechanisms. Adaptation policies for cities are also studied. Prerequisites: Science of Climate Change and Its Impacts, Climate Change Policy Analysis

425.635 Climate Modeling Techniques
The course is a survey of the history of climate modeling and also includes current modeling techniques. Students will understand the strengths and weaknesses of each climate model and how well climate models capture various processes. This class emphasizes the climate models prediction for the future with special attention to global level predictions. Prerequisite: Science of Climate Change and Its Impacts.

425.637 International Climate Change Policy
This course focuses on the international frameworks for responding to climate change. It includes a review of the history of international responses to climate change, highlights the negotiations -- what is agreed, what is outstanding, and where the fault lines exist -- and then examines efforts at integrating climate change into various international institutions. The course includes an examination of how climate change is likely to affect the ability of countries to fulfill their international commitments under other agreements. The course also examines the role of a range of international organizations such as the World Trade Organization, the World Intellectual Property Organization, regional bodies, international river and lake basin organizations, the UN Security Council, and the UN High Commissioner for Refugees Prerequisite - Science of Climate Change and Its Impacts, Climate Change Policy Analysis

425.638 Adaptation to Climate Change
Global climate change risks are increasingly complex and may ultimately affect virtually every facet of our economic, energy, community and environmental systems. At the same time, policy and investment responses to climate resiliency needs are similarly complex, controversial, and high stakes. Perhaps no issue facing leaders of today and tomorrow is more cross-cutting in nature, or in greater need of improved understanding and capability, than climate change risk. This course will provide a comprehensive framework for understanding, assessing and applying climate change risk, vulnerability and hazard assessment for the development of risk reduction and adaptation responses. In the process, it will examine the scope, status, limitations, and strengths of current assessment and action planning approaches across varying sectors, scales and impact areas. The course will also include review of methods for prioritizing actions and addressing feasibility, flexibility, and logistical needs as applied to specific facilities, such as military installations, as well broader communities and multistate regions. Individual and group learning exercises will be involved.

425.640 The Future of the US Electric System in a Carbon-Constrained World
The course looks at the future of the U.S. electric system and the influence of climate change on it. The class will explore the increasing demands for low-carbon emissions, the need for increased quantity and quality of electric power, cybersecurity

425.639
425.641
requirements, and other related issues. Class topics include constraints on the system such as the need for reliability, affordability, and geographic differences in the system and consumers requirements. The course will assess the strengths and weaknesses of current and next generation technologies expected to transform our Nation’s electric infrastructure, e.g., smart grid, renewable and distributed systems, and superconductivity. Students will learn the complexity of renovating this 120-year old system and the promise it holds for the future.

425.641 Carbon Capture and Storage
The course examines various aspects of carbon capture and storage (CCS) technology for power sector and industrial applications. Students will gain a solid understanding of the role and potential application of CCS for addressing climate change; the technology and science supporting the capture, transport and storage phases; the economics of various CCS applications; legal and regulatory permitting regimes in the United States, European Union, Australia and selected other jurisdictions. Assignments will emphasize practical skills development in financial and risk assessment evaluation.

425.644 Principles & Applications of Energy Technology II
This course builds on a number of ideas covered in the core EPT course, and as with the first course uses and integrates a broad range of ideas from science, engineering and economics. The course has two distinct but overlapping themes that will be often be covered in parallel. First, the course will broaden and deepen the coverage of the how some of the energy technologies discussed in the core course work, with a slightly more formal discussion and use of ideas from mechanics and thermodynamics, including the role of entropy; a few newer potential technologies, such as fusion and ocean will also be covered. Second the course will extend the coverage of the economics and operation of energy markets to provide a deeper understanding of how to value energy generation assets when facing an uncertain future, on both a stand-alone and integrated basis, and how these considerations play out in real electricity markets, including the role of energy, capacity and ancillary services. The course will include coverage of the potential role of energy storage and/or demand side management in integrating large scale renewable energy into the grid from both an operational and economic perspective.

425.645 Global Energy Policy
Energy policy is about more than sheer market design. Policy agendas have become increasingly complex, adding sustainability and development to traditional energy security concerns. In response, a patchwork of institutional frameworks have emerged, including clubs (OPEC, IEA), treaties, Energy Charter Treaty (ECT), agencies, International Renewable Energy Agency (IRENA) or policy networks, Renewable Energy & Energy Efficiency Partnership (REEEP). The course introduces students to the global dimensions of energy policy; discusses shifting agendas; and assesses the institutional spectrum of global energy governance.

425.646 US Offshore Energy: Policy, Science and Technology
“Offshore energy is progressively becoming a significant part of the U.S. energy mix. Oil from offshore platforms now accounts for roughly one-third of the U.S. domestic production, and significant interest has emerged for developing renewable energy resources in the ocean and the Great Lakes. Large-scale offshore wind projects have been proposed along the East Coast, and there is also interest in developing wave energy off the West Coast and the Pacific islands. Ocean current and tidal energy are the other emerging sources. This course will take a multi-disciplinary approach to offshore energy analysis. We will discuss both renewable resources such as offshore wind, and conventional resources such as offshore oil and gas. Topics covered will include: resource assessment, state and federal regulations, economics of offshore energy, environmental impact and benefits, space-use conflicts, cultural/tribal issues, public perception, offshore energy technology, and energy infrastructure. We will also review case studies on the proposed Cape Wind project and the Deepwater Horizon oil spill. In addition, we will discuss the recently launched National Ocean Policy initiative and how it is influencing offshore energy regulation. Subject-matter experts from federal regulatory agencies will be invited as guest speakers. By the end of the course, students will understand policies and regulations governing offshore energy in the U.S. They will also be conversant with the economics of resource development, technological drivers for harnessing the resources, and the scientific advances in assessing and mitigating environmental impact from energy production in offshore areas.”

Capstone
425.800 Capstone Project in Energy Policy and Climate
The capstone project enables students to apply and synthesize the material learned in other courses, develop expertise on a specific topic related to climate change science or policy, work closely with experts in the field of study, and improve professional writing and presentation skills. In the semester prior to conducting the project, students must identify a project topic and mentor who is both familiar with the chosen topic and willing to guide and oversee the project. The mentor may be a faculty member teaching in the program, a supervisor from the student’s place of work, or any expert with appropriate credentials. Formal proposals must be submitted at least two weeks prior to the start of the semester in which the project is to be completed. The proposal must be reviewed by the associate program chair prior to enrollment in the course. Permission of Instruction required.

Suggested Electives from Environmental Sciences and Policy
420.608 Oceanic and Atmospheric Processes
420.645 Environmental Challenges for Energy Policy
420.649 Strategic Mgmt for Sustainability
420.651 Risk Assessment and Risk Management
420.654 Environmental and Resource Economics
420.656 Environmental Impact Assessment and Decision Methods
420.657 Environmental Issues and Congressional Policymaking
420.659 Management for Environmental Results with Performance-Based Measurement
420.665 Climate Change at the Front Lines: The Study of Adaptation in Developing Countries

Suggested Electives from Geographic Information Systems
430.601 Geographic Information Systems (GIS)

Suggested Electives from Global Security Studies
470.734 Energy, Vulnerability, and War
470.773 Energy and Environmental Security

Electives from Other Johns Hopkins University Divisions
575.710 Financing Environmental Projects
575.723 Sustainable Development and Next Generation Buildings
To manage the Earth’s environment effectively, there is a need to understand the processes that shape the planet’s surface, control the chemistry of its air and water, and the production of the resources that humans depend on. At the same time, to implement scientific solutions to environmental problems, policies that are politically, socially, and economically feasible must be established and executed. Designed to address this challenge, the MS program in Environmental Sciences and Policy sits at the juncture of science and policy by providing students with solid science training that integrates the capacity to work on policy issues. Graduates of the program emerge with a combination of expertise in science and policy that enables them to assume key positions in public and private entities responsible for safeguarding our environmental future. Many of the program’s students are already employed in the environmental field but wish to enhance their training or move in new directions. Others are seeking to move into the arena of environmental science and policy.

The program offers a flexible curriculum that allows students to tailor their academic experience to suit their personal needs and interests. The program is open to students with limited scientific background as well as those that already have a background in environmental sciences. Core course work includes geology, hydrology, oceanography, meteorology, ecology, and policy making. Electives range across a spectrum from courses strongly oriented toward policy to ones focused more heavily on science. Electives are selected by students under the guidance of advisor.

The program was originally designed by members of the Department of Earth and Planetary Sciences at Johns Hopkins, in conjunction with experts in applied science at regional and federal institutes and agencies. Courses are taught by distinguished instructors with valuable experience in the academic, public, and corporate sectors. Many of the program’s alumni are highly successful professionals.

**ADMISSION REQUIREMENTS**

In addition to the materials and credentials required for all programs (see AAP Admission Requirements), the Master of Science in Environmental Sciences and Policy program normally requires:

- A grade point average of at least 3.0 on a 4.0 scale in the latter half of undergraduate studies. Particular interests and work experience may also be considered.
- One semester of undergraduate calculus and one semester of undergraduate statistics
- One semester of undergraduate general chemistry

Students who do not have the necessary undergraduate training in calculus, statistics, or chemistry may be offered provisional admission if their other credentials are strong.

Students who are admitted provisionally due to lack of quantitative skills have the option to:

1. Take appropriate courses at an accredited college/university (courses must be approved by the academic advisor); or
2. Take 420.301 Quantitative Methods for Environmental Sciences, or admissions staff.
Students who are admitted provisionally due to lack of training in chemistry have the option to:

1. Take one semester of general chemistry at an accredited college or university; or
2. Take 420.302 Chemistry of Natural Processes.

Admissions Documents

- AAP application and fee
- A current résumé or CV
- A statement of Purpose (500 words) addressing why at this time in your career you want to pursue this graduate degree and at JHU.
- Two letters of recommendation, preferably one academic reference
- Official undergraduate and graduate transcripts

Provisional Student

Provisional students are admitted to this status because, in the view of the admissions committee, they do not fulfill all academic requirements for admission as a degree candidate at the time of the application. Provisional students may be required to take specific prerequisite courses, and/or take a specific number of graduate-level courses and complete them successfully in order to establish their eligibility to be admitted as a degree candidate.

During the time of this provisional status, students are held to grading criteria stricter than those required of degree candidates (see Grading System, Requirements). Specifics of a provisional admission are outlined in the formal admissions letter mailed to the student. All listed criteria must be met for a student to continue to enroll in courses.

Math Test

Those provisional students who are required to take 420.301 Quantitative Methods for Environmental Sciences (see Prerequisite Courses in the Course Descriptions section) may choose to take a mathematics assessment test. If successfully passed, provisional students will place out of the prerequisite. To take the test please contact the AAP Admissions office at aapinfo@jhu.edu or call them at 202-452-1940.

Special Students

Students may be admitted to the ESP program as special students following the guidelines provided elsewhere in this catalog and administered by the admissions office. Special students in ESP may count no more than two courses toward the degree should they apply and be admitted to the program as a degree-seeking student.

MS IN ENVIRONMENTAL SCIENCES AND POLICY

The MS in ESP can be pursued with no concentration or by choosing one of the four concentrations listed on the next page.

NO CONCENTRATION

- Five core courses
- Five elective courses

For more information about core and elective courses, please see the course descriptions on the following pages. Note: All electives are not offered every semester and the mode of delivery (onsite or online) varies. It is very important that students consult the Environmental Sciences and Policy Course Schedule for specific class offerings and times by semester.

Electives should be chosen in consultation with the student’s advisor and should accommodate individual career goals. When a student elects the MS degree without a concentration, electives may be chosen from any combination of the environmental sciences and policy offerings. Students may also consider related courses in the schools of Engineering, Public Health, SAIS, Business, or Education (see Registering for Courses in Other Divisions/Programs).

Please refer to the Advanced Academic Programs Course Schedule for exact dates, times, locations, fees and instructors. Courses are open only to students who meet enrollment requirements.

Residency Requirement

Many courses are offered online, however at least one course must be taken in an onsite classroom or in-person field study course to fulfill the requirements of the degree. Intensive courses are offered in three-week formats in January, May, and occasional summer months to help facilitate the residency requirement. It should be noted, however, that for most of these compressed courses students are responsible for housing and travel to meet the residency.

Independent Research Project

The Independent Research Project is optional for students pursuing the MS degree without a concentration. However, students in the MS in Environmental Sciences and Policy Program with particular academic or professional interests, including those who are considering a Ph.D. in the future, may wish to pursue independent research by completing 420.800, Independent Research Project in Environmental Sciences and Policy.

The Independent Research Project is required for the MS with a concentration. Research must be original and bring a new perspective to a field or topic; it may include analysis of previously obtained data, and overview and synthesis of
published interpretations of such data, or original primary research in the field or lab. The general guidelines and timeline for the course can be found on the ESP website (The Experience > Independent Research Project). Note: if the project involves human subjects, clearance from the Johns Hopkins Institutional review Board (IRB) may be necessary and should be planned for as this process can take additional time.

FOUR OPTIONAL CONCENTRATIONS

Environmental Monitoring and Analysis
This concentration focuses on identifying, assessing, monitoring, and quantifying environmental problems as well as progress towards the redress of these problems. The concentration enables students to work on various topics with a focus on measurement and analytical techniques.

Required Courses
420.614 Environmental Policymaking and Policy Analysis
420.800 Independent Research Project in Environmental Sciences and Policy

Choose three of the following:
420.601 Geological Foundations of Environmental Science
420.604 Hydrology and Water Resources
420.608 Oceanic and Atmospheric Processes
420.611 Principles and Methods of Ecology

Electives
Choose five of the following:

Environmental Sciences and Policy Electives
420.619 Ecological Assessment
420.624 Contaminant Fate and Transport
420.626 Field Methods in Ecology
420.631 Field Methods in Stream and Water Quality Assessment
420.651 Risk Assessment and Risk Management
420.654 Environmental and Natural Resource Economics
420.656 Environmental Impact Assessment and Decision Methods
420.659 Management for Environmental Results with Performance-based Measurements
420.660 Strategies in Watershed Management

Energy Policy and Climate Courses
425.602 Science of Climate Change and its Impacts

Biotechnology Electives
410.662 Epidemiology: Diseases in Populations

Geographic Information Systems Courses
430.601 Geographic Information Systems (GIS)
430.602 Remote Sensing: Earth Observing Systems and Applications
430.603 Geospatial Data Modeling

Public Health Electives
187.610 Public Health Toxicology
188.680 Fundamentals of Occupational Health
340.601 Principles of Epidemiology

Engineering Electives
575.727 Environmental Monitoring and Sampling

Ecological Management
This concentration focuses on the management of natural resources within an ecological context. It enables students to understand particular ecosystems as well as broader issues within the ecological sciences applicable to various systems.

Required Courses
420.611 Principles and Methods of Ecology
420.614 Environmental Policymaking and Policy Analysis
420.800 Independent Research Project in Environmental Sciences and Policy

Choose two of the following:
420.601 Geological Foundations of Environmental Science
420.604 Hydrology & Water Resources
420.608 Oceanic & Atmospheric Processes

Electives
Choose five of the following:

Environmental Sciences and Policy Electives
420.619 Ecological Assessment
420.620 Soils in Natural and Anthropogenic Ecosystems
420.622 Ecotoxicology
420.623 Freshwater Ecology and Restoration of Aquatic Ecosystems
420.625 Ecology and Ecosystem Management in Coastal and Estuarine Systems
420.626 Field Methods in Ecology
420.628 Ecology and Management of Wetlands
420.631 Field Methods in Stream and Water Quality Assessment
420.657 Conservation Biology and Wildlife Management
420.658 Coastal Zone Processes and Policy
420.659 Landscape Ecology
420.661 Natural Resources Law and Policy
420.662 Public Lands–Private Interests: The Struggle for Common Ground
420.663 Strategies in Watershed Management
420.662 Coral Reefs and Caves: The Geology of the Bahamas

Geographic Information Systems Courses
430.601 Geographic Information Systems (GIS)
430.603 Geospatial Data Modeling

Environmental Management
This concentration focuses on finding balances among economic, environmental, and social interests. The field of study serves business leaders, who must consider environmental impacts of their decisions and develop competitive advantage
within an ecologically constrained world. The concentration is also important to environmental leaders who need business skills to keep agencies and non-profits afloat and who need to include economic issues in their proposed solutions to environmental problems.

**Required Courses**

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<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>420.614</td>
<td>Environmental Policymaking and Policy Analysis</td>
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<td>420.800</td>
<td>Independent Research Project in Environmental Sciences and Policy</td>
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<tr>
<td>420.601</td>
<td>Geological Foundations of Environmental Science</td>
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<td>420.604</td>
<td>Hydrology &amp; Water Resources</td>
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<tr>
<td>420.608</td>
<td>Oceanic &amp; Atmospheric Processes</td>
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<tr>
<td>420.611</td>
<td>Principles and Methods of Ecology</td>
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**Electives**

Choose five of the following:

**Environmental Sciences and Policy Electives**

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<tr>
<td>420.624</td>
<td>Contaminant Fate and Transport</td>
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<td>420.629</td>
<td>Drinking Water, Sanitation &amp; Health</td>
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<td>420.632</td>
<td>Outdoor Air Quality Management and Policy</td>
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<td>420.634</td>
<td>Bioremediation and Emerging Environmental Technologies</td>
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<td>420.641</td>
<td>Natural Resource Law and Policy</td>
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<td>Public Lands—Private Interests: The Struggle for Common Ground</td>
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<td>420.644</td>
<td>Sustainable Cities</td>
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<td>420.646</td>
<td>Transportation Policy and Smart Growth</td>
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<td>420.649</td>
<td>Strategic Mgmt for Sustainability</td>
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<td>420.650</td>
<td>International Environmental Policy</td>
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<td>Risk Assessment and Risk Management</td>
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<td>Environmental Justice</td>
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<td>420.654</td>
<td>Environmental &amp; Natural Resource Economics</td>
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<td>Environmental Impact Assessment and Decision Methods</td>
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<td>420.665</td>
<td>Climate Change on the Front Lines: The Study of Adaptation in Developing Countries</td>
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<td>420.668</td>
<td>Sustainable Food Systems</td>
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<td>420.669</td>
<td>Applied Sustainability</td>
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**Energy Policy and Climate Electives**

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<th>Course Code</th>
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<tr>
<td>425.601</td>
<td>Principles and Applications of Energy Technology</td>
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<td>425.602</td>
<td>Science of Climate Change and its Impacts</td>
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**Applied Economics Elective**

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<tr>
<td>440.622</td>
<td>Cost-Benefit Analysis</td>
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**Government Program Elective**

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<tr>
<td>470.667</td>
<td>The Administrative State: How Washington Regulates</td>
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**Nonprofit Management Electives**

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<tr>
<td>470.625</td>
<td>Resource Development and Marketing in Nonprofits</td>
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<td>470.728</td>
<td>Influence and Impact of Nonprofits</td>
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<td>470.736</td>
<td>Principles of Nonprofit Management</td>
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<tr>
<td>470.774</td>
<td>Nonprofit Governance and Executive Leadership</td>
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<td>470.779</td>
<td>Financial Management and Analysis in Nonprofits</td>
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**Whiting School of Engineering**

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<td>575.407</td>
<td>Radioactive Waste Management</td>
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<td>575.423</td>
<td>Industrial Processes and Pollution Prevention</td>
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<tr>
<td>575.707</td>
<td>Environmental Compliance Management</td>
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<tr>
<td>575.747</td>
<td>Environmental Project Management</td>
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**Environmental Planning**

The focus of this concentration is to implement solutions to environmental problems in concrete situations. Environmental planning examines the interaction of the built environment and the natural environment in order to reduce impacts and restore the quality of both the natural environment and human settlements.

**Required Courses**

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<tr>
<td>420.614</td>
<td>Environmental Policymaking and Policy Analysis</td>
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<tr>
<td>420.800</td>
<td>Independent Research Project in Environmental Sciences and Policy</td>
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<tbody>
<tr>
<td>420.601</td>
<td>Geological Foundations of Environmental Science</td>
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<tr>
<td>420.604</td>
<td>Hydrology &amp; Water Resources</td>
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<tr>
<td>420.608</td>
<td>Oceanic &amp; Atmospheric Processes</td>
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<tr>
<td>420.611</td>
<td>Principles and Methods of Ecology</td>
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**Electives**

Choose five of the following:

**Environmental Sciences and Policy Electives**

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<td>420.619</td>
<td>Ecological Assessment</td>
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<tr>
<td>420.629</td>
<td>Drinking Water, Sanitation &amp; Health</td>
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<tr>
<td>420.634</td>
<td>Bioremediation and Emerging Environmental Technologies</td>
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<td>420.639</td>
<td>Landscape Ecology</td>
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<td>Natural Resources Law and Policy</td>
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<td>420.642</td>
<td>Public Lands—Private Interests: The Struggle for Common Ground</td>
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<td>Transportation Policy and Smart Growth</td>
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<td>Risk Assessment and Risk Management</td>
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<td>Management for Environmental Results with Performance-Based Measurement</td>
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<td>420.662</td>
<td>Coral Reefs and Caves: The Geology of the Bahamas</td>
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<td>420.665</td>
<td>Climate Change on the Front Lines: The Study of Adaptation in Developing Countries</td>
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<td>Sustainable Food Systems</td>
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<td>420.669</td>
<td>Applied Sustainability</td>
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Energy Policy and Climate Courses
425.601 Principles and Applications of Energy Technology
425.602 Science of Climate Change and its Impacts

Geographic Information Systems Courses
430.601 Geographic Information Systems (GIS)
430.602 Remote Sensing: Earth Observing Systems and Applications
430.603 Geospatial Data Modeling

Whiting School of Engineering
575.731 Water Resources Planning

Carey Business School
241.710 Sustainable Evelopment

BA/MS OPTION FOR JOHNS HOPKINS UNIVERSITY
GECS MAJORS

Undergraduates majoring in Global Environmental Change and Sustainability (GECS) may apply for accelerated status towards an MS in Environmental Science and Policy (ESP). These students should declare their intention to pursue the MS during their junior or early in their senior year of undergraduate study by contacting either the undergraduate GECS Director, Cindy Parker (ciparker@jhsph.edu) or the Program Director of the ESP program, Antoinette WinklerPrins (antoinette@jhu.edu). GECS students may apply up to three courses taken as undergraduates towards the MS in Environmental Science and Policy thereby leaving only seven more courses to complete the MS following receipt of their BA.

Application
GECS students may apply for the BA/MS anytime during the senior year or up to one year following conferral of their BA. The application procedure is the same as that of other AAP applicants and details are found online at: advanced.jhu.edu/admissions. Students admitted to the BA/MS program will be assigned a graduate advisor, but will continue to be advised by their GECS advisor for all matters concerning the BA degree.

Course Requirements for BA/MS
GECS students will receive two separate degrees and so the requirements of both degrees must be fulfilled. Students may not earn the MS degree without completion of the BA, however, students who do not complete the MS retain their BA. GECS BA/MS students must complete all the requirements of the MS in ESP and may opt for either the general ESP degree or a concentration. Up to three courses completed while an undergraduate can count towards the ten courses required for the MS. Specifically, up to two of the following courses can be used to satisfy the corresponding core course requirements for the MS in Environmental Science and Policy:

> 270.308 Population and Community Ecology may substitute for 420.611 Principles and Methods of Ecology
> 271.403 Environmental Policymaking and Policy Analysis may substitute for 420.614 Environmental Policymaking and Policy Analysis

(Note that the Environmental Policymaking and Policy Analysis course will be a combined GECS undergraduate and ESP masters class.)

If a student wishes to apply a third course to both their GECS BA and their ESP MS, the course must be approved by the graduate advisor and must be at the 300- or 600-level with content germane to environmental science and policy.

PREREQUISITE COURSES

The prerequisite courses below prepare provisional students for graduate work and do not count toward degree requirements. Students must be admitted as provisional in order to enroll in these courses.

420.301 Quantitative Methods
This prerequisite course provides the necessary background in mathematics for students who do not have sufficient undergraduate course work in calculus and statistics. Students who receive a provisional admission because of math deficiency can opt to take the mathematics assessment test. If the student earns a score of 80% or better, then s/he is not required to take the course. In this course, students acquire quantitative skills and an understanding of mathematical principles fundamental to environmental sciences, and necessary for evaluating the implications of policy measures. Topics include probability and statistics, systems of equations, analytical geometry, and basic concepts of calculus. Problem sets, interpretation of data, and applications to everyday problems help students appreciate the usefulness of quantitative methods. Offered online twice a year.

420.302 Chemistry of Natural Processes
This course provides students with a basic understanding of the fundamentals of chemistry, of Earth’s interrelated chemical systems, and of how to manipulate and interpret chemical data. Topics include molecules and chemical bonding, states of matter, thermodynamics, and kinetics. Through a series of exercises, students apply chemistry principles to solve real-world environmental problems. Offered online twice a year.

Prerequisite: Students are urged to take 420.301 Quantitative Methods for Environmental Sciences before enrolling in this course.

CORE COURSES

The core courses introduce the relevant, foundational body of knowledge in science and policy required of all students. Some students may have covered most of the material of one or more of the core courses in previous academic work; such students should consider requesting that the appropriate core course(s)
be waived (see Student Special Requests). If approved, the waived core course must then be replaced with an additional elective. The core courses can be taken in any order, although it is recommended that students begin with 420.601 Geological Foundations of Environmental Science. Students should complete the five core courses within the first seven courses in the program toward their degree.

420.601 Geological Foundations of Environmental Science
[formerly Earth Resources and Their Waste Products] This course provides an overview of Earth’s materials, processes, and resources for environmental scientists and policymakers. Topics include minerals, rocks, sediments, stratigraphy, structure, geomorphology, and geologic environments. Emphasis is placed on understanding geologic principles and methods as applied to environmental science, Earth resources, and public policy. Two field trips are part of the course for in-person sections. Offered onsite or online two to three times each year.

420.604 Hydrology & Water Resources
This course provides students with an introduction to the global hydrological cycle and the influence of climate, geology, and human activity. Students study the principles of precipitation, evaporation, and evapotranspiration; surface and groundwater flow; storage in natural and artificial reservoirs; water quality and pollution; and water resource management and regulation. One required field trip is included for in-person sections. Offered onsite or online two to three times each year.

420.608 Oceanic & Atmospheric Processes
In this course, students study the oceans and the atmosphere as interrelated systems. The basic concepts of air masses, water masses, winds, currents, fronts, eddies, and storms are linked to permit a fundamental understanding of the similar nature of oceanic and atmospheric processes. Among the course’s topics are weather forecasting, global climate change, marine pollution, and an introduction to applied oceanography. A field trip is included for in-person sections. Offered onsite or online two to three times each year.

420.611 Principles & Methods of Ecology
This course examines the relationship between organisms and their biotic and abiotic environment at three levels of biological hierarchy: individual organism, population, and community. Population characteristics, models of population dynamics, and the effect of ecological interactions on population regulation are discussed in detail. The structure and function of natural and man-made communities and the impact disturbances have on community structure are also examined. Students are led to appreciate the importance of ecology in solving environmental problems. Two required field trips are included. It is offered every year during a fall or spring 14-week semester. To meet the needs of distance students, it is also offered in an Intensive, approximately three week long version in May and sometimes in July.

420.614 Environmental Policymaking and Policy Analysis
This course provides students with a broad introduction to U.S. environmental policymaking and policy analysis. Included are a historical perspective as well as an analysis of future policymaking strategies. Students examine the political and legal framework, become familiar with precedent-setting statutes such as NEPA, RCRA, and the Clean Air and Clean Water Acts, and study models for environmental policy analysis. Cost benefit studies, the limits of science in policymaking, and the impact of environmental policies on society are important aspects of the course. A comparison of national and international policymaking is designed to provide students with the global perspective on environmental policy. Offered onsite or online two to three times each year. Offered at Homewood Campus each spring term.

420.615 Environmental Restoration
This is field-centered course focused on the prehistoric and land use histories of river, freshwater tidal wetland and serpentinite environments that have been recently restored or with the potential to be restored in the Maryland and DC region. Knowledge of prehistoric ecological conditions and post-settlement impact provides important long-term guidelines for restoration, mitigation and conservation measures. This 14-week course includes 5-6 required Saturday or Sunday field trips which will replace 4-5 Monday evening classes. The dates of the field trips will be determined during the first class to best fit with student and teacher schedules. Field trips include identification of plant indicator species, bird identification and introduction to transect and quadrat methods of vegetation analysis. Classroom sessions provide background on geology, paleoecology, historical impact, vegetation, bird population changes, and conservation and restoration approaches at the field sites. Students work with aerial photos, historic maps and documents, geographic maps, on-line sources, and paleo-ecological data derived from pollen, macrofossil, geochemical and geomorphic analyses. Offered infrequently.

420.619 Ecological Assessment
This course introduces students to concepts and tools used in quantitative ecological assessment and demonstrates how they can be applied in managerial or regulatory contexts. The course covers assessment strategies, methodologies for ecological assessment, design of sampling programs, indicators of ecological integrity, bioassessment, and coping with uncertainty, ecological risk assessment, and adaptive environmental assessment and management. Students are introduced to approaches for population, ecosystem, community, watershed, and landscape-level assessment. Computer exercises reinforce concepts and familiarize students with a variety of assessment techniques. Offered every two years. Prerequisite: 420.611 Principles and Methods of Ecology, equivalent course, or experience.
420.620 Soils in Natural & Anthropogenic Ecosystems
This course introduces students to basic concepts of soil science and the soil's contribution to the functions of natural and anthropogenic ecosystems. It provides an overview of soil morphological, physical, chemical, and biological properties, and how these interact to form a soil with unique characteristics and ecosystem function. Students discuss soils of the world from the perspective of soil taxonomy, the processes that form these soils, and land use properties specific to each soil order. Students learn to read soil maps, to interpret and predict the quality and land use potential of soils, and to use available soil data. Current issues regarding the proper use and management of soils are investigated. In-person sections of the course include field trips. Offered onsite or online annually. Prerequisite: 420.601 Geological Foundations of Environmental Science.

420.622 Ecotoxicology
This course covers fundamental of ecotoxicology including chemical action on organisms, organ systems and cellular functions. Modeling is used to investigate fate and transport mechanisms, concentration effects and selective toxicity. Toxicity testing, risk assessment, toxics reduction and examples of bioremediation are also covered. Topics are covered in a framework of basic ecology including trophic structure, food-web dynamics, bioaccumulation, and effects of toxic materials on ecosystems and individuals. Offered infrequently. Prerequisite: 420.611 Principles and Methods of Ecology, equivalent course, or experience.

420.623 Freshwater Ecology & Restoration of Aquatic Ecosystems
This course focuses on the ecology, protection, and restoration of non-tidal waters. Students study the biological, chemical, and physical characteristics of the waters and riparian zones. There is also a focus on ecological responses to anthropogenic activity and approaches to protection and damage mitigation in freshwater ecosystems. Ongoing and planned protection and restoration activities in Maryland and elsewhere are presented. Students develop holistic restoration plans based on existing ecological data. Two weekend field trips are required parts of the course. Offered every two years. Prerequisite: 420.611 Principles and Methods of Ecology.

420.624 Contaminant Fate and Transport
This course presents the basic principles underlying the movement of contaminants in the predominant environmental media: surface water, groundwater, and the atmosphere. These principles are combined with modeling of contaminant transport in the different media to design remediation programs, provide the technical foundation of policy decisions, and support the evaluation of risk to the environment and human health caused by pollutants. Students in the course develop the skills to ask the right questions of modelers; understand the implications and limitations of model results; and communicate effectively to the public and decision makers. Students should have strong mathematical reasoning skills. Offered onsite or online every other year. Prerequisites 420.604 Hydrology and Water Resources, equivalent course or experience.

420.625 Ecology and Ecosystem Management in Coastal and Estuarine Systems
This course examines the physical, chemical, and biological processes affecting coastal and estuarine ecosystems with special emphasis on the Chesapeake Bay as a model system. Human influences on such large and critical ecosystems and the policy decisions made to manage and minimize human impact are explored in lecture and seminar formats. Topics include the hydrodynamics of shallow tidal waters; energy and material flows and transformations; diversity and adaptation of plant, animal, and microbial communities; population and pollution ecology; and ecosystem management. Case histories illustrate problems in fisheries management and the eutrophication of the coastal and estuarine systems. In-person sections include required weekend field trips to Chesapeake Bay sites. Offered infrequently. Prerequisite: 420.611 Principles and Methods of Ecology, equivalent course, or experience.

420.626 Field Methods in Ecology
This course centers on practical field exercises to develop both technical proficiency and broader understanding of varied ecological systems. Field methods include quadrate, transect, and SAV sampling as well as multiple techniques for surveying animal communities and monitoring water quality. While analyzing their own data, students develop deeper understanding of fundamental concepts such as species-area curves, importance values, species diversity, and community similarity indices. Students also are introduced to paleoecological tools such as sediment coring. Several ecological processes including succession and the effect of disturbances on community structure are demonstrated. The significance, advantages, and disadvantages of various surveying methods are explored in classroom meetings, but for much of the course students conduct their studies in the forests, fields, and wetlands of the area. This course is not offered online and fieldwork is scheduled for a succession of Saturdays; some sections may conduct field trips on one or two Fridays and/or Sundays. Offered most summers. Prerequisite: 420.611 Principles and Methods of Ecology, equivalent course, or experience.

420.628 Ecology and Management of Wetlands
This course explores the biological, physical, chemical, and ecological aspects of tidal and non-tidal wetland ecosystems. Topics include wetland classification, valuation, function and dynamics. Wetland modification and manipulation are analyzed through case studies of restoration, construction, and mitigation. The effects of federal and state laws, of various regulations, and of human perturbations are explored. In-person sections include field trips that provide hands-on experience and demonstrate the significance of wetland mitigation, restoration and construction projects. Offered onsite every two years. Prerequisite: 420.611 Principles and Methods of Ecology, equivalent course, or experience.

420.629 Drinking Water, Sanitation & Health
In this course students examine scientific and public policy dilemmas related to the provision of safe drinking water and related protection of global human health. Course work emphasizes basic understanding of the fundamentals of water supply, treatment, regulation, and sanitation as well as...
providing a focus on unresolved issues confronting scientists, resource managers, and policymakers. Students work to develop recommendations for solutions to critical issues as controlling pathogens from urban and agricultural runoff, managing harmful by-products of the disinfection process, regulating arsenic in ground water, evaluating the risk posed by exposure to mixtures of contaminants, and confronting the threat of terrorist attacks on water supplies. Offered onsite or online annually. Prerequisite: 420.604 Hydrology and Water Resources, equivalent course, or experience.

420.631 Field Methods in Stream & Water Quality Assessment
This course provides an overview of field methods used to sample and assess various biological, physical, and chemical components in streams, rivers, and lakes. It allows students to determine the impact human activity has on aquatic environments. Students gain hands-on experience with standard sampling techniques, and with the detection, identification, and quantification of biological specimens and chemical pollutants in the aquatic environment. Students discuss water quality standards and federal regulations such as the Clean Water Act and Safe Drinking Water Act. Also included are study design, gear selection, sample preservation, and safety. Basic approaches to analyze and report findings are covered, with emphasis on methods currently practiced by government resource agencies. Offered onsite every two years. Prerequisite: 420.611 Principles and Methods of Ecology, equivalent course, or experience.

420.632 Outdoor Air Quality Management and Policy
Understanding and mitigating air pollution, both indoor and outdoor, is of extreme importance to global health. Underscoring this, the World Health Organization released a statement in 2014 that in 2012, approximately 7 million people died - one in eight of total global deaths around the world – as a result of air pollution exposure. Air pollution also has a strong impact on climate change, in terms of its abilities to both exacerbate and reduce global warming. This course provides an overview of the principles, effects, and policies regarding outdoor air quality with an emphasis on emerging international air quality issues, public health and environmental impacts of outdoor air pollution, and evolving ways to monitor air quality. Course topics include: history of air pollution events and management; major air pollutants and sources; atmospheric chemistry; transport and dispersion; measurement and monitoring; control technology; effects on human health and climate; and regulatory requirements. The effectiveness of the Clean Air Act, approaches toward air quality management in other countries, international treaties, future air quality projections, and regulatory case studies will also be discussed. Prerequisite: 420.608 Oceanic and Atmospheric Processes, an equivalent course or experience, or approval of the instructor.

420.634 Bioremediation & Emerging Environmental Technologies
(formerly Environmental Remediation Technologies) This course presents details of environmental technologies for assessment and remediation of contaminated sites. The course includes a brief review of environmental policy related to impacts of hazardous chemicals and endocrine blockers, but focuses on remediation technologies available for reclaiming contaminated resources and reducing health risks. It covers the application of multiple physical and chemical technologies, but emphasizes use of biological systems for the cleanup of hazardous chemicals. In the course, students are introduced to the nature of hazardous waste, behavior of chemicals in the subsurface, biochemistry of microbial degradation and technology applications. Bioremediation technologies covered include bioventing, air sparging, monitored natural attenuation or intrinsic remediation, and chemical oxidation. Students learn to select appropriate technologies, design a monitoring program for assessing the applicability of bioremediation techniques, develop biological conceptual models for natural attenuation, and understand the key principles for design. Case studies and problem sets acquaint students with field applications and introduce modeling techniques for predicting performance. Prerequisites: 420.601 Geological Foundations of Environmental Science and 420.604 Hydrology and Water Resources, equivalent courses, or experience.

420.635 Integrated Water Resources Management
Integrated water resources management provides coordinated, goal-oriented control for development of river, lake, ocean, wetland and other water assets. This course provides students with a broad introduction to U.S., EU and international perspectives. The evolution of basic concepts behind IWRM will be explored as well the limits of current practices and strategies. Students will examine several different conceptual frameworks, and become familiar with how various US water management agencies and international institutions such as the World Bank, USAID, UNDP and the EU apply the principles of IWRM in various settings. Associated concepts of river basin management, climate adaptation and sustainable development will be addressed within the context of IWRM. Case studies will be presented and evaluated by the students.

420.637 Conservation Biology and Wildlife Management
In this course, students examine the meaning and implications of biodiversity with a focus on disciplines associated with conservation biology, wildlife conservation and wildlife management, including taxonomy, genetics, small population biology, chemical and restoration ecology, and marine biology. This includes exploring how conservation biology differs from other natural sciences in theory and in application. Students learn the major threats to biodiversity and what natural and social science methods and alternatives are used to mitigate, stop, or reverse these threats. The course also includes the economic and cultural tradeoffs associated with each conservation measure at the global, national, regional, and local levels. The course is taught in the seminar-style with two weekend field trips to facilities where conservation biology will be interpreted. Offered onsite every two years. Prerequisite: 420.611 Principles and Methods of Ecology, equivalent course, or experience.

420.638 Coastal Zone Processes and Policy
The course is designed to provide the student with knowledge to address modern coastal, environmental, geologic, and policy
issues. The course will focus on the coasts, barrier-islands, major estuaries, and inner continental shelf areas of the United States. Fundamental coastal engineering principles will be described in order to address methods used for public works projects including hurricane protection, beach nourishment, and tidal inlet maintenance. The policies pertinent to management and use of coastal environments will be studied. One weekend field trip will be required. Prerequisite: 420.614 Geophysical Foundations of Environmental Science, equivalent course, or experience.

420.639 Landscape Ecology
Landscape ecology is a rapidly developing area of study that explicitly examines the effects of spatial pattern and scale on ecological processes that unfold over areas of several square kilometers or larger. Thus, landscape ecology provides many concepts, tools, and approaches that will enhance the effectiveness of endeavors such as watershed management, ecosystem management, design of conservation reserves and green infrastructure, and smart growth. The goal of this course is to give students a firm grasp of the concepts of landscape ecology and of how they can be applied to enhance the effectiveness of environmental policy, management, regulation, and assessment. Offered online or onsite every year. Prerequisite: 420.614 Principles and Methods of Ecology, equivalent course, or experience.

420.641 Natural Resources Law and Policy
This course introduces students to federal and state legislation and policies of critical importance in natural resource management. Students explore such issues as regulation of ocean fishing, coastal zone management, mineral exploitation and associated environmental impact, water allocation and quality, hazardous waste cleanup programs under the Superfund law, urban industrial infrastructure such as water and sewage systems, land use management, and water and air pollution control. Offered online or onsite every year. Prerequisite: 420.614 Environmental Policymaking and Policy Analysis, equivalent course, or experience.

420.642 Public Lands-Private Interests: The Struggle for Common Ground
This course prepares students to participate in the great debate over the use and protection of America’s federally owned forests, rangeland, parks, and sanctuaries. Students consider such questions as how much should be paid for grazing on federal lands; how to balance the demand for timber harvest with the need for watershed and wildlife management; who controls mineral and oil extraction on federal lands; and who has the rights to waters flowing through federal lands and stored behind federally funded dams. These and similar issues of today and tomorrow are studied in the context of history, statute and case law, and administrative regulations. Offered infrequently. Prerequisite: 420.614 Environmental Policymaking and Policy Analysis, equivalent course, or experience.

420.644 Sustainable Cities
(formerly Cities, Urbanization, and the Environment)
This course examines urbanization and its impacts on the environment. The goal of the course is to better understand how urbanization contributes to ecological damage as well as how cities can be constructed in ecologically healthy ways. Topics include land use planning transportation, waste, management, water quality, open space/greening, green building technology, urban design, and urban ecology. The course takes an international perspective by using case studies of cities in North America, Europe, Asia, Latin America, and Africa. The case studies also include a wide range of cities with different populations, geographic scale, and growth rates. Final projects are an in-depth study of one particular city of the student’s choice and its attempts to implement programs for sustainability. Prerequisite: 420.614 Environmental Policymaking and Policy Analysis, equivalent course, or experience.

420.645 Environmental Challenges for Energy Policy
The course examines energy supply and consumption, and how these activities impact the environment, with a focus on understanding the potential technology, market structure and policy implications for climate change and air quality. Particular emphasis is devoted to the electricity and transportation sectors, which combined represent over two-thirds of U.S. energy production and use. Students will gain a solid understanding of the science, economics, environmental impact and potential policies associated with various electricity generation technologies, including renewable energy, such as wind and solar, conventional generation (existing and future), carbon storage and sequestration, and electricity storage. Transportation topics will address a variety of technologies, including hybrids and fuels cells, as well as the potential role for alternative fuels, including biofuels. A range of policy alternatives will be discussed, including traditional command and control-style regulations, emissions trading (for both SO2 and carbon dioxide) and other market-based tools, portfolio standards, technology incentives and the potential role of publicly funded R&D.

420.646 Transportation Policy and Smart Growth
This course examines how transportation policy and decisions can alleviate or prevent problems resulting from urban sprawl. How can transportation decisions and planning contribute to more “livable” urban designs and land use patterns that promote “smart growth”—growth that is environmentally and ecologically sustainable? Students discuss how different environmental media—land, water, and air—are affected by our transportation systems and resulting development patterns, and how the design of transportation systems—the highways, roads, transit systems, and bike and walk paths—can more closely harmonize with nature and provide communities with a better quality of life. A wide range of policy options is examined, from altering the structure of road pricing to redesigning neighborhoods and altering urban form. A number of case studies are examined to illuminate the issues and principles raised in the course. Offered online or onsite every year. Prerequisite: 420.614 Environmental policymaking and policy analysis, equivalent course, or experience.
How can transportation decisions and planning contribute to more “livable” urban designs and land use patterns that promote “smart growth”—growth that is environmentally and ecologically sustainable? Students discuss how different environmental media—land, water, and air—are affected by our transportation systems and resulting development patterns, and how the design of transportation systems—the highways, roads, transit systems, and bike and walk paths—can more closely harmonize with nature and provide communities with a better quality of life. A wide range of policy options is examined, from altering the structure of road pricing to redesigning neighborhoods and altering urban form. A number of case studies are examined to illuminate the issues and principles raised in the course. Offered online or onsite every year. Prerequisite: 420.614 Environmental Policymaking and Policy Analysis, equivalent course, or experience.

420.649 Strategic Mgmt for Sustainability
“This course examines the “greening of industry” trend, its causes, and its implications for public policy. The course first examines environmental behavior from the strategic perspective of firms and industry associations. From the old emphasis on legal compliance, leading firms now have turned to a much more strategic view, and many have adopted an explicit goal of promoting sustainability. We consider the causes of this behavior among leading firms and the many forms that it has taken, as well as the meanings of sustainability within the industrial sector. The course then turns to a consideration of how public policy has influenced this trend and to government’s response to these changes within industry. The course concludes with an evaluation of these policy responses and likely trends in industry and government. Prerequisite: 420.614 Environmental Policymaking and Policy Analysis, equivalent course, or experience.”

420.650 International Environmental Policy
This course explores the methods and strategies for promoting solutions to global environmental problems. Through consideration of issues such as stratospheric ozone depletion, global climate change, tropical deforestation, loss of biodiversity, transnational pollution, and other threats to the international commons, students examine policymaking from the perspective of developed and developing countries, the United Nations system, international financial entities, and nongovernmental interest groups. By investigating important international agreements, students determine how far the international community has come in solving specific problems, what obstacles prevent effective international solutions, and what needs to be done to overcome barriers. Prerequisite: 420.614 Environmental Policymaking and Policy Analysis, equivalent course, or experience.

420.651 Risk Assessment and Risk Management
Analysis of risk is becoming an increasingly important component of regulatory decision making. Based on the premise that risk assessment has no “right” answers, this course explores what risk perception, risk management, and risk communication mean. Students are introduced to terminology and concepts necessary in risk communication. Case studies help to explain the complexities of risk assessment and management. Students learn how to balance the costs and benefits of risk reduction and how to account for the uncertainties in risk estimates. Prerequisite: 420.614 Environmental Policymaking and Policy Analysis, equivalent course, or experience.

420.652 Environmental Justice
The field of environmental justice is riven with conflicts over the scope, measurement, evaluation, nature and seriousness of environmental problems. This course takes a seminar approach to develop options for resolving environmental justice problems using both practical and theoretical approaches for communication, understanding and analysis to bridge interests, reconcile differences, reduce confusions and improve environmental decision making. The course will investigate and evaluate the effectiveness and possibilities of policies that can highlight, educate and develop understanding among communities concerned with environmental issues. The course will focus on how communication can encourage discussion about potential causes and responses to environmental justice concerns. A primary area of the course will be to examine how disenfranchised groups understand environmental justice within a hierarchy of community concerns, accumulated experience and particular histories within communities. The course has an applied aspect and will look at a local manifestation of how environmental justice is inseparable from broader components of justice such as living and working conditions, violence, powerlessness, marginalization, and processes producing and reproducing inequities. Prerequisite: 420.614 Environmental Policymaking and Policy Analysis, equivalent course, or experience.

420.654 Environmental & Natural Resource Economics
This course presents the fundamental concepts and applications of economic theory related to renewable and nonrenewable resources, and environmental protection. Topics covered include the economics of resource use and depletion, the relationship between the environment and the economy as a whole, the role of government in addressing market failure, concepts and methods for valuing of environmental benefits, cost-benefit analysis of regulatory policies, and how economic incentives can be used to protect the environment. Offered online or onsite every year. Prerequisite: 420.614 Environmental Policymaking and Policy Analysis.

420.655 Federal Environmental Compliance in Public Transit
This course provides a comprehensive investigation of public transit systems in the United States. We’ll focus specifically on environmental compliance requirements that apply to various types of public transit infrastructure, with an emphasis on those that receive federal funds. Using extensive case studies of real projects, students will gain an applied understanding of environmental policy and the wide variety of environmental statutes and requirements that govern the planning and construction of public systems. This case study approach will include an exploration of the history and context of how public transit has developed over the centuries, along with the important changes in environmental statutes and regulations that have been applied to federally funded transit projects. In
addition, the course will provide a look at recent policies enacted to expedite the environmental review of surface transportation projects, giving students the opportunity to assess those reforms and consider other policy options for reaching the same goals. Offered infrequently.

420.656 Environmental Impact Assessment & Decision Methods
This course introduces the process of environmental impact assessment and policy decision making as required under the National Environmental Policy Act (NEPA) and the regulations of the Council of Environmental Quality (CEQ). Topics include identification of purpose and need for any actions affecting the environment, development of objectives and decision criteria, and various techniques for assessing impact and comparing alternatives for a given environmental intervention. The strengths and weaknesses of various approaches are evaluated with techniques that allow analysis of multiple objectives and conflicting uses of environmental resources. The importance of scientific credibility and public acceptance is demonstrated with actual cases. Offered onsite or online annually. Prerequisite: 420.614 Environmental Policymaking and Policy Analysis, equivalent course, or experience.

420.657 Environmental Issues & Congressional Policymaking
This course explores how Congress debates and passes environmental legislation, including the way in which scientific facts are introduced to nonscientists and scientific inquiry is used and misused by Congress. Students learn to appreciate the powerful influences of the media and of lobbyists in swaying congressional decision making. Case studies provide perspective into which environmental legislation has been effective and which has not and the reasons for success or failure. A field trip to Capitol Hill and classroom simulation of a congressional committee debate give students insight into the give and take of the process. Offered onsite infrequently. Prerequisite: 420.614 Environmental Policymaking and Policy Analysis, equivalent course, or experience.

420.659 Management for Environmental Results with Performance-Based Measurement
At all levels of government and throughout private industry, performance-based initiatives now place unprecedented demands on environmental managers to achieve measurable environmental results. The goal of the various performance based initiatives is to give environmental managers a systematic understanding of the causes of environmental problems, both natural and anthropogenic, and their human, ecological and economic effects. It is also at the heart of sound environmental impact analysis, risk assessment, and benefit-cost analysis. In this course, students learn the foundations and applications of modern performance-based initiatives. Using case studies taken from a variety of environmental programs, students learn to use available scientific knowledge to uncover the likely keys to program success. Students learn why success has so often eluded environmental managers in the past. The goal of this class is for students to critically assess the design, performance measurement and management of environmental programs on all scales and to recommend effective improvements.

Students will develop skills for implementing results oriented environmental management.

420.660 Strategies in Watershed Management
This course provides an overview of natural resource management using the watershed as an example. It proposes that water resources are a primary indicator of environmental quality and that the watershed—of various dimensions—is an appropriate context for addressing resource management concerns. In addition to examining the theoretical framework for watershed management, the class will spend several weekends conducting extensive field research to produce a watershed quality management report. Fieldwork will include documenting land use practices, tributary flow rates and characteristics, and water quality measurements for unit loading estimations, sediment sampling and fish trawls. Some of this work will involve time on an EPA research vessel. Prerequisites: 420.611 Principles and Methods of Ecology, equivalent course, or experience.

420.662 Coral Reefs and Caves: The Geology of the Bahamas
This course presents an opportunity to study the physical, chemical and biological processes that operate to produce carbonate platforms (e.g. tides, waves and the growth of corals), geomorphic processes that operate to further shape carbonate platforms (e.g. ground-water flow, cave development and soil development), and the environmental impacts of human activities on carbonate platforms. The course consists of two weeks of intensive, online study followed by a week of field study at the Forfar Field Station on Andros Island in the Bahamas. Note: This course counts toward residency requirement. Offered as intensive field course every January. Prerequisite: 420.601 Geological Foundations of Environmental Science.

420.665 Climate Change on the Front Lines: The Study of Adaptation in Developing Countries
Poor and developing countries are predicted to bear the brunt of climate change. This course will focus on key sectors such as agriculture, forestry, biodiversity, water resources, human health, and tourism and the ways in which poorer and developing counties are impacted by and adapting to climate change. This course may focus on a region or a specific country depending on the instructor. Assessment and evaluation of demographic trends, environmental challenges such as retreating ice, potential flood hazards, ecosystem impacts, as well as health issues will be incorporated. International instruments such as adaptation funds, carbon funds, clean development mechanisms, and reduced deforestation/degradation strategies and policies will be investigated in a comparative analysis of impacts and adaptation responses of countries around the world. Offered onsite every two years.

420.668 Sustainable Food Systems
This course will consider the environmental and social challenges of providing a sustainable global food system. We will investigate the geographic patterns of agricultural and food production systems, emphasizing contemporary patterns and how these came to be. Attention will be given to agricultural
systems from the local to the global scale and we will consider
the global distribution of production and consumption of
agricultural products. The impacts of global change issues
such as climate change, energy crops, population growth, and
urbanization on food production will be also be part of the
course. This course has no prerequisites. This course will be
offered on an annual basis either in an online or onsite format.

**420.666 Applied Sustainability**

This course examines the history and current trends in the
expanding field of sustainability. Students will be exposed to
a wide range of case studies, local field visits and discussions
with sustainability practitioners in Maryland to determine
the current state of the science as well as impediments to
progress. Additional work includes state-of-the-art sustainability
leadership training, and practical application through
development and implementation of a sustainability-related
project. Two field trips are essential parts of the course. Offered
as intensive field course every other summer.

**420.680 Special Topics in Environmental Sciences and
Policy**

Important and timely topics related to environmental sciences
and policy that are not part of the regular course offerings
examined with particular emphasis on the applied and problem-
solving aspects of the topics. Specific topics vary by semester
and are listed in registration materials.

**420.686 Special Topics in Environmental Sciences and
Policy**

Important and timely topics related to environmental sciences
and policy that are not part of the regular course offerings
examined with particular emphasis on the applied and problem-
solving aspects of the topics. Specific topics vary by semester
and are listed in registration materials.

**420.700 Environmental Communication**

Communication drives both environmental science and policy
with increasing importance. Modern media have substantially
changed the level and focus of messaging and education
about environmental issues. This course is centered on actual
production of modern tools including a student run blog
and podcast series. Students form the editorial board of the
JHENS blog (http://jhens.jhu.edu) as well as planning, writing
and managing content. Reviews of academic literature on
environmental communication will be included in weekly
discussions. Offered infrequently.

**420.800 Independent Research Project in Environmental
Sciences and Policy**

An Independent Research Project (IRP) is required for students
electing the ESP MS degree with one of the concentrations. It
is optional for students not electing a concentration. Students
must have completed at least eight courses in the program
before completing an IRP. The independent research project
enables students to apply and synthesize the material learned
in their courses, develop expertise on a specific environmental
topic, work closely with an expert in the field, and improve their
professional writing skills. Students who elect this option must
identify a project topic and mentor who is both familiar with
the chosen topic and willing to guide and oversee the project.
The mentor may be a faculty member teaching in the program
or elsewhere at JHU, a qualified and appropriate person from
the student’s place of work, or any expert with appropriate
credentials. A preliminary proposal must be approved by the
mentor and the course instructor prior to enrollment in the
course. In order to enroll for the class, permission of instructor
is required. The mentor agreement form must be completed and
returned at the beginning of the semester in which the student
in take the I.R.P. course. That form is available on the ESP-IRP
website, as is a document that spells out all the requirements
and a timeline for completion. Final proposals for the IRP must
be approved by the mentor and the course instructor at least two
weeks prior to the start of the semester in which the IRP is to be
completed. A mentor agreement form must be completed and
returned at the beginning of the semester in which the student
in take the I.R.P. course. This form is sent to the Mentor by the
Course Instructor once the final proposal is approved. For more
information please go to the ESP-IRP website (http://advanced.
jhu.edu/academics/graduate-degree-programs/environmental-
sciences-and-policy/the-experience/independent-research-
project/). Offered every term and scheduled as needed.

**Elective Courses**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>420.601</td>
<td>Geological Foundations of Environmental Science</td>
</tr>
<tr>
<td>425.602</td>
<td>Science of Climate Change and its Impacts</td>
</tr>
<tr>
<td>425.603</td>
<td>Climate Change Policy Analysis</td>
</tr>
<tr>
<td>430.601</td>
<td>Geographic Information Systems (GIS)</td>
</tr>
</tbody>
</table>
| 430.602     | Remote Sensing: Earth Observing Systems and
Applications” |

**MS in Environmental Sciences and Policy/ Graduate Certificate in Geographic
Information Systems**

The use of Geographic Information Systems has become
standard for many environmental professionals. At the same
time, environmental work remains one of the most popular and
powerful applications of GIS investigations. To enable students
to better exploit the complementary nature of the fields, we
have eliminated the overlap between the MS in Environmental
Science and Policy and the Graduate Certificate in GIS. This
enables students to earn both the MS degree and the Graduate
Certificate by completion of a total of 13 courses rather than
the 15 courses that would be required to complete the programs
separately.

Interested students, including those already enrolled in either
program, should apply to the combined MS in ESP/Graduate
Certificate in GIS program. New students may select to this
option at the time of application. Current students should consult
their academic advisor and apply by filing a Change of
Program Form with the Registration Office.

Course requirements can be pursued simultaneously and are as
follows:
MS in Environmental Sciences and Policy:

- Five core courses (no ESP concentration) or four core courses plus an Independent Research Project (ESP with concentration)
- Five elective courses to include both:
  - 430.601 Geographic Information Systems (GIS)
  - 430.602 Remote Sensing: Earth Observing Systems and Applications

Certificate in Geographic Information Systems:
Any three of the following:

- 430.600 Web Mapping
- 430.603 Geospatial Data Modeling
- 430.604 Spatial Analysis with GIS
- 430.605 Development and Management of GIS Projects
- Substitution with other GIS courses allowed
Geographic Information Systems (GIS) as a science and technology is a dynamic and versatile method of data analysis and visualization that has come to play a key role in understanding numerous processes and is used in various industries, including natural resource management, environmental planning, homeland security, defense and intelligence, marketing, telecommunications, economic development, transportation, law enforcement, and public health and other health care industries. It is this dynamism that the Johns Hopkins University GIS programs encompass in its offerings, the Master of Science in GIS and the Post-Baccalaureate Certificate in GIS.

These two programs are fully online and provide a strong foundational education that delves into the principles and real-world applications of GIS, allowing students to build their credentials and capitalize on a marketplace that continues to grow in its demand for skilled employees. The Master of Science in GIS is designed to prepare the next generation of geospatial professionals skilled in all facets of GIS, including project management, web-based application development, geodatabase administration, spatial data analysis and geodata visualization.

Both programs are designed for students who have little or no knowledge of the GIS field, as well as students with prior experience. Students entering either program will be introduced to state-of-the-art and the most widely used commercial software, as well as open-source software, and the increasingly important cloud computing infrastructure. The program is designed to introduce students to the basic discipline of geographic information as a system and a science. Introductory material is built onto by delving into the design considerations of web-based GIS applications and data analysis. Students in the program can expect to work on real-world geospatial data issues with real data, and the accompanying issues those data introduce into a spatial analysis.

ADMISSION REQUIREMENTS

In addition to the materials and credentials required for all programs (see Admission Requirements), the Master of Science and Certificate in Geographic Information Systems program requires:

1. A grade point average of at least 3.0 on a 4.0 scale in the latter half of undergraduate studies. Particular interests and work experience may also be considered.
2. One semester of undergraduate calculus and one semester of undergraduate statistics.

Students who do not have the necessary undergraduate training in calculus or statistics may be offered provisional admission if their other credentials are strong. Students who are admitted provisionally due to lack of quantitative skills have the option to:

1. Take appropriate courses at an accredited college/university;
2. Take 420.301 Quantitative Methods for Environmental Sciences; or
3. Pass a math placement test, administered by the admissions staff.
Admissions Documents

> AAP application and fee
> A current résumé or CV
> A statement of purpose explaining how GIS is an appropriate avenue of instruction for your career needs
> Two letters of recommendation, preferably one academic reference
> Official undergraduate and graduate transcripts

Provisional Student

Provisional students are admitted to this status because, in the view of the admissions committee, they do not fulfill all academic requirements for admission as a degree candidate at the time of the application. Provisional students may be required to take specific prerequisite courses, and/or take a specific number of graduate-level courses and complete them successfully in order to establish their eligibility to be admitted as a degree candidate.

During the time of this provisional status, students are held to grading criteria stricter than those required of degree candidates (see Grading System, Requirements). Specifics of a provisional admission are outlined in a formal admissions letter mailed to the student. All listed criteria must be met for a student to continue to enroll in courses.

Math Test

Those provisional students who do not have the necessary quantitative background may choose to take a mathematics assessment test. If successfully passed, provisional students will place out of the prerequisite. To take the test please contact the AAP Admissions office at aapinfo@jhu.edu or call them at 202-452-1940.

PROGRAM STRUCTURE

Post-Baccalaureate Certificate

Five courses are required to complete the certificate. All courses are taught online, giving students access to the best geospatial experts, regardless of their location.

Students choose five (5) out of the following six (6) courses:

430.600 Web Mapping
430.601 Geographic Information Systems (GIS)
430.602 Remote Sensing: Earth Observing Systems and Applications
430.603 Geospatial Data Modeling
430.604 Spatial Analysis with GIS
430.605 Development and Management of GIS Projects

Master of Science

A) Five out of Six Certificate courses (see above)
B) Four electives from the list below.
C) Capstone Project

Elective Courses (Four Courses)

The following elective courses are offered as part of the Master of Science of GIS. We recommend that one of the four electives be a GIS programming course, and one be a Spatial Data Management course.

430.606 Programming in GIS
430.607 Spatial Databases and Data Interoperability
430.608 GIS and Spatial Decision Support Systems
430.609 Spatial Data Management: Quality and Control
430.611 Geospatial Ontology and Semantics
430.612 Cartographic Design and Visualization
430.613 Advanced Topics in Remote Sensing
430.615 Big Data Analytics: Tools and Technique
430.617 Demographics Modeling
430.618 Advanced Python Scripting for GIS
430.619 Advanced Web Application Development
430.800 Capstone for Geographic Information Systems

For more information about core and elective courses, please see course descriptions. Please note that not all courses are offered every semester, and the GIS Course Schedule should be consulted for current classes and times.

Students may also consider taking related courses in other divisions of AAP, especially the Environmental Sciences and Policy and Energy Policy and Climate Programs. Students are permitted, with permission of the GIS Program Coordinator to take up to two pertinent courses outside of the GIS curriculum to fulfill their requirements towards the degree. Not all these elective choices are offered in an online format. Please refer to the Advanced Academic Programs Course Schedule for exact dates, times, locations, fees and instructors. Courses are open only to students who meet enrollment requirements.

COURSE DESCRIPTIONS

Core Courses

430.600 Web Mapping

Web Mapping is an important foundation course in which students will become familiar with the current platforms available for delivering Web GIS and sharing geographic content over the web. Professionals in various industries often have to make information readily available and with current developments this has become easier than ever. The class offers a fundamental understanding of creating and designing web
Elective option for Govt. Analytics students. Web services enabling different kinds of functionality in a web map, such as editing, geoprocessing, geocoding, image analysis, etc. will be examined. Caching basemaps and working with tiled map services will be covered. Offered twice a year.

**430.601 Geographic Information Systems (GIS)**

In this introductory course, students become familiar with the concepts and gain the experience necessary to appreciate the utility of Geographic Information Systems in decision-making. Topics covered include the fundamentals of data structures, georeferencing, data classification, querying, cartography, and basic spatial data analysis. The course provides an overview of the capabilities of GIS software and applications of GIS. Class time is divided between lectures and GIS exercises that reinforce critical concepts. Students must complete a term project as part of the course. Offered every semester. Elective option for Govt. Analytics students.

**430.602 Remote Sensing: Earth Observing Systems and Applications**

This course introduces remote sensing as an important technology to further our understanding of Earth’s land, atmospheric, and oceanic processes. Students study remote sensing science, techniques, and satellite technologies to become familiar with the types of information that can be obtained and how this information can be applied in the natural and social sciences. Applications include assessment of land cover and land use, mapping and analysis of natural resources, weather and climate studies, pollution detection and monitoring, disaster monitoring, and identification of oceanographic features. Offered once a year in spring.

**430.603 Geospatial Data Modeling**

This course moves beyond the fundamentals of GIS to explore the constraints surrounding data modeling as well as the methods to model spatial data. Students review current research in the field, learn relevant modeling techniques, and utilize advanced software tools for analysis. The course focuses on various kinds of spatial data, how it is collected, handled, processed, and analyzed through GIS technologies. As the term progresses, students deal extensively with different types of data presentations and the manipulation of those data in GIS models. Students develop a significant GIS project over the course of the semester and present their findings at the end. Offered twice a year.

**430.604 Spatial Analysis with GIS**

This course introduces students to using various techniques for solving spatial problems. The course teaches a proven process one can utilize to address common geographic inquiries including site suitability analysis, line of sight (visibility) analysis, network analysis, geostatistical analysis, spatial interpolation, etc. Students will also learn to apply the principles of spatial statistics to address the distributional and locational aspects of spatial data within a variety of situations. Examples and assignments are drawn from many GIS applications, such as business, urban planning, public safety, public health, transportation and natural sciences. Offered twice a year. Elective option for Govt. Analytics students.

**430.605 Development and Management of GIS Projects**

This course introduces students to project, program, and portfolio management standards, which will guide them on how to successfully manage GIS projects. Students will learn how to apply core project management principles and guidelines to real project scenarios. The course will impart knowledge and skills for managing GIS projects throughout their entire lifecycle, while addressing technical, ethical, and institutional problems. Students will explore key issues in organizational management, including earned value management, resource planning, and communications. During the course, students will learn how to determine the return on investment of a GIS project, create a comprehensive schedule and budget, as well as determining risk management, quality control, and contract management skills in support of your GIS project. Offered once a year.

**Elective Courses**

**430.606 Programming in GIS**

In this course, students will learn how to automate workflows and develop tools using Python scripts as well as develop web mapping applications using Application Programming Interfaces (APIs). The course is split in two sections. The first section covers Python as a scripting language which provides an easy way for automating complex GIS tasks and functionality, thus simplifying workflows and increasing efficiency. The second section teaching basic principles of developing web mapping applications utilizing JavaScript APIs. The students will learn how to develop rich, interactive web mapping applications which contain common GIS functionality such as selection, querying, geocoding, routing, editing and geoprocessing. Offered once a year.

**430.607 Spatial Databases and Data Interoperability**

A well-designed database is necessary to construct and maintain spatial integrity. In this course, students learn the different database designs for stand-alone databases and enterprise database systems. This course examines the requirements for a GIS Decision Support System by focusing on the design of the data schema, identifying the necessary data elements and their formats, and exploring data Interoperability as a designed constituent of a database. Data management routines for maintaining the spatial integrity will also be introduced. Offered once a year. Prerequisite: Introduction to GIS, Geospatial Data Modeling.

**430.608 GIS and Spatial Decision Support Systems**

GIS can be a very effective tool to assist in making decisions for a wide range of applications at the local, regional and global scale. This course will examine the use of GIS as a spatial decision support system for systematic policy analysis and scenario modeling. Case studies will be used from the areas of agriculture, conservation planning, homeland security, land use planning, natural disasters, transportation, urban planning and water resources. Offered once a year. Prerequisite: Introduction to GIS, Introduction to Spatial Data Analysis.

**430.609 Spatial Data Management: Quality and Control**

Spatial data quality is a major concern for any GIS. This course examines the nature of errors in spatial data and various aspects of spatial data quality, including positional and thematic.
accuracy, resolution, precision, completeness and logical consistency. The impacts of errors on the reliability of GIS-based analysis are explored. Various strategies to improve the quality of spatial data are addressed, including the use of standards for spatial data (FGDC, OGC and ISO) and data management tools. Offered once a year. Prerequisites: Introduction to GIS, Geospatial Data Modeling

430.611 Geospatial Ontologies and Semantics
The Geospatial Semantics and Ontologies course examines the foundations, design, and implementation of effective linked data modeling technologies and approaches for geospatial data. Linked data, based on the node-edge-node triple data model, address challenges associated with the use of variable terms used in GIS applications, and their associations within related enterprises and information exchange over the Internet as the Geospatial Semantic Web. Students will begin their study with a general approach to semantics and ontology, and Extensible Markup Language (XML) and the Geography Markup Language (GML) extension, information interchange formats of the Internet. Coursework next focuses on Open Source data formats and Internet services for linked geospatial data, such as Resource Description Framework (RDF) and Well Known Text (WKT), and SPARQL and GeoSPARQL graph patterns for information networking. The last half of the course introduces Web Ontology Language (OWL) for control of data for semantic inference. OWL is used to build formal (logic) representations called ontologies that govern data interchange. Students will design and build a simple ontology pattern to present to the class. These basic sets of skills provide the foundation of advanced geospatial linked data applications, such as those in progress in business, publishing, research, and government. Offered once a year. Prerequisite: Geographic Information Systems

430.612 Cartographic Design and Visualization
The Cartographic Design and Visualization course focuses on the fundamentals of cartography, spatial statistics, thematic mapping techniques, 3D mapping, and web based mapping. Students will gain an inter-disciplinary understanding of cartographic representation and visualization with hands on applications using cutting edge GIS and graphic design software to create purpose tailored maps. Upon successful completion of this course, students will be able to interpret and appropriately communicate spatial data; have developed a personalized cartographic style; will have created a professional GIS portfolio for current/potential employers; and most importantly will have developed a keen appreciation for maps and spatial awareness! Offered once a year. Prerequisite: Introduction to GIS

430.613 Advanced Topics in Remote Sensing
This course explores the various remote sensing platforms, collection systems, processing methods, and classification approaches to remotely sensed data. Discussion of image adjustment techniques, relative orientation, and geo-referencing methods are compared. Topics include hyperspectral imaging, spectral analysis, and image filtering. Offered once a year. Prerequisite: Introduction to GIS, Remote Sensing; Earth Observing Systems and Applications

430.615 Big Data Analytics: Tools and Techniques
The explosion of data collection methods from a vast array of data sources in volumes previously unimaginable has tested the limits of traditional technology, which are not able to scale to the requirements of massive data. Big Data is the field of data studies where the data is identified by very large volumes, high velocity in data generation, and data format variety. This course explores Big Data technologies while utilizing cloud infrastructures. We will discuss the characteristics and architectural challenges surrounding Big Data, and explore geo-visualization techniques of data processed using Big Data Analytics. Students will work in a cloud computing environment to build Hadoop clusters, NoSQL databases, and work with other open source technologies to process data stores like Census data, and twitter feeds. Offered once a year. Prerequisite: Introduction to GIS, Statistics

430.617 Demographics Modeling
Census data is the most often used data in geospatial studies. Census data provide information on the demographic composition of household all the way through state and national population trends. Census data also serve the data layers that form the basis of most mapping applications. In this course, students will learn how to work with Census data in a GIS by understanding the vast amounts of data collected in support of the decadal Census, how to discover and read the various tables that associate with the raw Census data, and how to create custom data layers for demographic models in Economics, Housing, and Population Studies. Prerequisite: Geographic Information Systems (GIS) (430.601), its equivalent, or permission of the instructor

430.618 Advanced Python Scripting for GIS
This course focuses on advanced uses of Python as a scripting tool to automate workflows in GIS and to create customized applications. This includes the development of script tools, utilizing advanced ArcPy modules, working with third-party modules, implementing Python geoprocessing services, customizing GIS applications and more advanced Python functionality. Offered once a year. Prerequisites: Programming in GIS

430.619 Advanced Web Application Development
This course is designed to provide students with advanced experience in web application development. It focuses on uses of Web APIs for developing rich and interactive web mapping applications. HTML, CSS and JavaScript as well as data and functionality from GIS web services will be leveraged to create complex web mapping applications providing end users with geocoding, routing, geoprocessing, editing and other advanced capabilities. Widgets will be examined to quickly develop solutions, but the emphasis will be placed on tasks which provide more control over server-side functionality. Conceptual and technical documentation and samples will be greatly utilized. The course will facilitate heavy engagement in the large and growing community of Web API developers. Offered once a year. Prerequisite: Programming in GIS.
Capstone

430.800 Capstone for Geographic Information Systems
The capstone is the culmination of the instruction and training a student receives in the MS in GIS program. In this course, the student selects a mentor, identifies a topic of interest, acquires the relevant data required for the study, develops a data model and/or analysis method, devises the visualization of the data as part of the data interpretation, and summarizes the study in a final report. Students are encouraged to make their presentations at a GIS conference or publish the results of their study in a peer-reviewed GIS publication. Students are responsible for selecting a mentor who may be a JHU faculty member, a qualified and appropriate person from the student’s place of work, or any expert with appropriate credentials. Offered once a year. Prerequisite: core course requirements for MS in GIS, requisite courses for MS in GIS, (at least 8 courses).
Center for Advanced Governmental Studies


advanced.jhu.edu/govstudies

The Johns Hopkins University Center for Advanced Governmental Studies (Center) encompasses a broad set of programs and initiatives designed to enhance students’ understanding of the role, function, and impact of government and the nonprofit sector. At the heart of the Center are eight graduate programs: MA in Government, MA in Global Security Studies, MA in Public Management, dual MA in Government/MBA, MS in Government Analytics, Certificate in Government Analytics, Certificate in Intelligence, and Certificate in Nonprofit Management. In addition, the Center is involved in a number of government and private sector partnerships.

Based at the Johns Hopkins University (JHU) Washington, DC Center in Dupont Circle, the Center is a forum for policy discussions and provides a venue for unbiased efforts to expand knowledge of the various governmental components, how they interact, and how they comply with their mandated accountability in administering the affairs of state. The mission of all the Center’s programs and initiatives is to provide a strong foundation of knowledge upon which innovative policy programs and promising leaders can develop.

GRADUATE DEGREES

The graduate degree programs of the Center bring together theory and practice in the study of government and its impacts domestically and abroad, while preparing individuals for leadership positions in the public and private sectors. At the Center, students use their graduate studies to better inform their professional work and find that their practical work experience often augments their graduate studies. While our degree programs are designed as part-time studies, students have the option of accelerating their course of study by attending at a full-time pace.

In addition, students have various options for combining our Master’s degrees with our Certificates in Intelligence or Government Analytics, allowing them to graduate with two credentials after pursuing a concentrated and efficient course of study.

PARTNERSHIPS, EVENTS, AND PUBLICATIONS

The Center for Advanced Governmental Studies is involved in a number of government and private sector partnerships. We welcome opportunities for collaborations and initiatives that fit within the Center’s goals of educational exchange and workshop/training efforts that further the understanding of the roles and functions of government.
The Center has developed and instituted ongoing leadership exchange programs between US federal executives and their counterparts in China, Germany and other countries. In addition, the Center hosts special events, policy workshops, and summits with embassies, government agencies, Washington think tanks, and other organizations. A series of papers is published by the Center on topics that can help inform current policy debates. The most recent is “Government by Contract: Considering a Public Service Ethics to Match the Reality of the ‘Blended’ Public Workforce” (governmentbycontract.jhu.edu).

INTERNATIONAL STUDY
The Center for Advanced Governmental Studies at JHU offers degree-seeking students frequent opportunities for intensive international study. The basic format is several intensive course meetings and readings with JHU professors before the students leave; spending one or two weeks abroad with classes about four and a half hours a day and field trips or other exercises; and a research project or major paper due after students return. Past courses have included “The Birth of Modern Democracy” (Scotland and France), “China’s Place in the 21st Century,” “Command and Leadership in Modern War: Operation Overlord,” (United Kingdom and France), “Politics, Security and Culture in Israel,” “Politics, Security and Culture in India,” “Environmental Governance, Climate Change and Energy Security in Europe and America” (Belgium and Germany), and “Policymaking in the US and Latin America: Perceptions and Misconceptions” (Mexico).

Upcoming Study Abroad Courses:

470.755.91 - Sustainable Cities in France and Germany: Lessons for the United States May 2015

NOTE ON SPECIAL INTERNATIONAL STUDY COURSE OFFERING: The MA in Government and MA in Global Security Program will offer an international course for the May Intersession of 2015, Sustainable Cities in France and Germany: Lessons for the United States (470.755.91), to be held in Washington DC, Berlin (Germany) and Paris (France). This course will be cross-listed with the Environmental Sciences and Policy and the Energy, Climate and Policy Programs. This course is the equivalent of one elective course in the MA in Government Program, the MA in Global Security Program, the MA in Public Management, and with permission can be a non-online elective for the MS in Government Analytics. The course can count toward the Seminars Studies Concentration for the MA in Government. It can also count as the core energy and Environmental Security Concentration required class for the Global Security Program.

We are in what has been dubbed the “urban era” with more than half of the world population living in cities. Smart sustainable cities are seen as key to achieving global sustainability goals as set forth by the United Nations and also to meet goals of the sustainability initiatives of the European Commission. Berlin is widely recognized as a leader in both energy efficiency and water efficiency and Paris is considered a “pioneer in the smart cities arena” as it unabashedly strives to be a ville verte. The course will cover the policies and projects in Berlin and Paris addressing climate change (mitigation, adaptation and resilience), comprehensive energy planning, sustainable transportation, water infrastructure management and land-use planning.

Special emphasis will be given to informing students about the potential transfer and application of the selected policies and projects to the United States. The format of this class consists of equal parts briefings with senior-level national and local governmental officials and site visits to pioneering projects that offer potential lessons for adoption in the United States. Reading materials will consist of case studies and background materials designed to interpret the evolution of the project and in some cases the comparisons with equivalent projects in the US.

ADMISSION REQUIREMENTS
In addition to the materials and credentials required for all programs, the Master of Arts in Government, the Master of Arts in Global Security Studies, the Master of Arts in Public Management, the Master of Science in Government Analytics, the Certificate in Government Analytics, the Certificate in Intelligence, and the Certificate in Nonprofit Management require a grade point average of at least 3.0 on a 4.0 scale. However, a 3.0 GPA does not guarantee admission. Particular interests and work experience will also be considered.

Application Documents
> AAP application and fee.
> Official undergraduate transcripts and graduate transcripts from all institutions attended, not just the degree granting institution(s).
> A current résumé.
> Two letters of recommendation. Applicants must use the AAP form.
> A statement of purpose (1-2 pages double-spaced) that explains the applicant’s reasons for seeking admission and how the degree will be used for career advancement or academic enrichment.
> A writing sample of 5-10 pages that is research focused. The purpose of the writing sample is to demonstrate the applicant’s ability to make and support an argument. If the applicant does not have an existing research-focused writing sample that he or she wishes to submit, the applicant may write a five-page paper on one of the following questions:

MA in Government applicants please respond to the following:
“If men were angels, no government would be necessary. If angels were to govern men, neither external nor internal controls on government would be necessary. In framing a government which is to be administered by men over men, the great difficulty lies in this: you must first enable the government to control the governed; and in the next place oblige it to control itself.” — James Madison, Federalist 51
In this well-known quote, Madison points toward the age-old problem of reconciling democracy and political power. Discuss this problem in reference to some recent policy issues or political events, citing at least three references.

**MA in Global Security Studies applicants please respond to the following:**

“[America] goes not abroad in search of monsters to destroy. She is the well-wisher to freedom and independence of all.”

—John Quincy Adams

This quote reflects the trends in American national security for much of the nation’s history. Are the implications that can be drawn from the statement consistent with the demands of American national security in the 21st century? Discuss this problem in reference to some recent policy issues or political events, citing at least three references.

**MA in Public Management applicants please respond to the following:**

“A memorandum is not written to inform the reader, but to protect the writer.” —Former Secretary of State Dean Acheson

Please discuss whether you think the quote from former Secretary Acheson is accurate or not and why?

**Certificate in Nonprofit Management, Certificate in Government Analytics and Certificate in Intelligence applicants do not need to submit a writing sample.**
Master of Arts in Government  
government.jhu.edu

COURSE REQUIREMENTS AND CONCENTRATIONS*

> Four core courses (includes thesis courses)
> Eight elective courses
> Symposia (for more information visit advanced.jhu.edu/academics/graduate-degree-programs/government/the-experience/symposia)

For more information about core and elective courses, please see the course descriptions on page 120. Please note that not all electives are available each semester.

For information on exact dates, times, locations, fees, and instructors for any term, students should consult the Advanced Academic Programs Course Schedule (advanced.jhu.edu) available several months before each semester begins. Courses are open only to students who meet enrollment requirements. All classes are held at the Johns Hopkins University (JHU) Washington, DC Center at 1717 Massachusetts Avenue, NW, close to Dupont Circle. Select online courses are also offered every semester and the degree may be pursued and completed entirely online as an option for some students.

CURRICULUM

The curriculum of the JHU Master of Arts in Government Program is designed for working adult students who have specialized skills in a particular field and desire the broader perspective necessary for leadership in politics and administration. The courses are based on the latest scholarly and scientific knowledge, but emphasize the application of such knowledge to practical governmental, political, and policymaking problems of today. Classes are designed to maximize individual attention, encourage student contribution, build analytical skills, and provide the tools for engaging in original research. All of this leads to lively and stimulating seminar discussions and an enriching graduate school experience. There is an active speaker and symposia calendar of events as well, and students are required to attend two symposia events during each semester that they are enrolled in classes.

Sequence of Study

Elective courses may be taken in any order, but the core and required courses must be taken in this sequence: Government and Politics, Research and Thesis I, Research and Thesis II, and Research and Thesis III. Students cannot register for these courses out of order. In their first semester, students take the core course, Government and Politics, which introduces students to the basic tenets of government and politics.

Students should take the required courses, that is, Research and Thesis I early in the program (i.e., as their third or fourth class); and the third core class, Research and Thesis II shortly after. The final required course of the program is Research and Thesis III, which students take after completing all other core and required courses and electives.

There are three concentrations offered in the Government Program for students choosing to specialize in one of these specific areas: Political Communication, Security Studies, and Legal Studies. The concentration in Political Communication provides students with the opportunity to study with practitioners in the field: reporters, political operatives, journalists, and campaign and news and media professionals. The concentration in Security Studies covers the fundamentals of administering and preserving American security. The concentration in Legal Studies provides students with an opportunity to better understand the interaction between political and governmental institutions in the legal and criminal justice system and related legal and ethical issues. Students may (but are not required to) identify a concentration in one of the fields after completion of the core courses.

Students must complete the core course, Government and Politics, eight electives, and the three required thesis courses, which include completion of the final thesis paper to be awarded an MA in Government.

Thesis Process

The thesis is a portfolio of three papers which are thematically linked and written during the course of the student’s graduate school career. The papers are accompanied by an introductory critical comment of approximately 8-10 pages and a conclusion of similar length which both address the contribution that these papers make to the existing literature and further address the way in which the three papers are interrelated.

Students are expected to have written the literature review for their theses in the Government and Politics course prior to enrolling in Research and Thesis I. During Research and Thesis I

PROGRAM ADVISING

Dorothea Israel Wolfson, Ph. D.
dorotheawolfson@jhu.edu  
202.452.1123
I, students will study research and writing methods in more depth and expand their literature review to write the first paper of their portfolio thesis. In Research and Thesis II, students will, under the supervision of the thesis instructor, write and revise the second and possibly third paper for submission that is appropriate for their thesis portfolio. Students have the option of taking 470.709 Quantitative Methods instead of Research and Thesis II with permission of the instructor. By the conclusion of Research and Thesis I and II, all students will have at least two of their three required thesis papers completed. The third paper should be well under way in Research and Thesis II also, but it can be reworked and revised during the remaining elective courses. Students will bring these three papers to their final class of the program, Research and Thesis III. In this course, students will work on any small revisions to the three papers and write the critical comment that thematically links the three papers together. The thesis must be successfully defended in order to graduate.

**Online Option for Completing the MA in Government Degree**

All required courses in the MA in Government program are available online, along with many electives. This allows students to pursue and complete the degree completely online. All course requirements are the same for online and on-ground students. Students may opt to take online classes along with on-site classes throughout their course of studies as well. All students taking an online course for the first time must complete an orientation/training session on Blackboard before they begin their class.

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**CORE COURSES AND THESIS**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>470.602</td>
<td>Government and Politics</td>
</tr>
<tr>
<td>470.850</td>
<td>Research and Thesis I</td>
</tr>
<tr>
<td>470.852</td>
<td>Research and Thesis II or Research and Thesis II OR Quantitative Methods (may be substituted, with permission of the instructor)</td>
</tr>
<tr>
<td>470.800</td>
<td>Research and Thesis III: Government and GIS</td>
</tr>
</tbody>
</table>

**Sample Courses for the Political Communication Concentration**

Select four.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>470.609</td>
<td>Leadership Skills in the 21st Century</td>
</tr>
<tr>
<td>470.615</td>
<td>Speechwriting: Theory and Practice</td>
</tr>
<tr>
<td>470.622</td>
<td>Money and Politics</td>
</tr>
<tr>
<td>470.626</td>
<td>Understanding the Media: Old and New</td>
</tr>
<tr>
<td>470.637</td>
<td>Lobbying and Influence</td>
</tr>
<tr>
<td>470.638</td>
<td>Negotiating as a Leadership Skill</td>
</tr>
<tr>
<td>470.649</td>
<td>Behind the Numbers: Polling and American Elections</td>
</tr>
<tr>
<td>470.652</td>
<td>Primaries, Caucuses, Conventions and the General Election</td>
</tr>
<tr>
<td>470.657</td>
<td>Politics, the Media, and Presidential Campaigns</td>
</tr>
<tr>
<td>470.687</td>
<td>The Political and Social Media Revolutions</td>
</tr>
<tr>
<td>470.732</td>
<td>Communications and Congress</td>
</tr>
<tr>
<td>470.735</td>
<td>Politics and the New Journalism</td>
</tr>
<tr>
<td>470.737</td>
<td>The Media and Presidential Politics</td>
</tr>
<tr>
<td>470.749</td>
<td>Changing News Cycles</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>470.757</td>
<td>Nonfiction Writing and Politics</td>
</tr>
<tr>
<td>470.791</td>
<td>Political Writing and Communications</td>
</tr>
</tbody>
</table>

**Sample Courses for the Security Studies Concentration**

Select four. Note: Any course offering in the MA in Global Security Studies counts toward this concentration.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>470.644</td>
<td>Democracy and Its Modern Critics</td>
</tr>
<tr>
<td>470.654</td>
<td>Global Trade, Policy and Competition</td>
</tr>
<tr>
<td>470.655</td>
<td>Multinationals and Governments in the Age of Globalization</td>
</tr>
<tr>
<td>470.661</td>
<td>Constitutional Law</td>
</tr>
<tr>
<td>470.662</td>
<td>Special Topics in Criminal Investigation</td>
</tr>
<tr>
<td>470.711</td>
<td>Intelligence: From Secrets to Policy</td>
</tr>
<tr>
<td>470.762</td>
<td>US-Mexico Relations: Migration, Trade, and Organized Crime</td>
</tr>
<tr>
<td>470.768</td>
<td>Nation Building as Security Policy</td>
</tr>
</tbody>
</table>

**Sample Courses for the Legal Studies Concentration**

Select four.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>470.610</td>
<td>American Political Thought</td>
</tr>
<tr>
<td>470.616</td>
<td>The Law and Public Institutions</td>
</tr>
<tr>
<td>470.617</td>
<td>The Courts and Public Policy</td>
</tr>
<tr>
<td>470.661</td>
<td>Constitutional Law</td>
</tr>
<tr>
<td>470.674</td>
<td>Regulations: Law of Federal Agencies</td>
</tr>
<tr>
<td>470.705</td>
<td>The Majesty of the Law: Judicial Process in America</td>
</tr>
<tr>
<td>470.712</td>
<td>The American Civil Trial</td>
</tr>
<tr>
<td>470.721</td>
<td>Business Law and Corporations in the Global Economy</td>
</tr>
<tr>
<td>470.727</td>
<td>Equality Law</td>
</tr>
<tr>
<td>470.730</td>
<td>Intellectual Property Law</td>
</tr>
</tbody>
</table>

For course descriptions, see page 144.
Management education typically addresses the public and private sectors separately. Universities typically offer the MBA degree for business leadership and the MA, MPP, or MPA for public sector management. The assumption is that managers working in the public and private sectors are involved with completely different sets of issues and problems. The reality is that both face similar challenges, and managers frequently move from the public sector to the private sector and vice versa.

The MA in Government/MBA uniquely prepares individuals for the combination of public and private sector responsibilities they are likely to face during their careers. This program enables those working in government to expand their knowledge and skills in business and management, preparing them to take on leadership roles in nonprofit, public sector, or commercial enterprises. Students in these degrees complete both the professional managerial education requirements of the MBA and the advanced disciplinary requirements of a specialized MA in Government. Graduates of the Johns Hopkins University (JHU) MA in Government/MBA are capable of integrating rigorous scholarship with business acumen in bringing both intellectual and strategic leadership to the complex challenges of management in government and business in today's global economy.

The MA in Government/MBA is designed with class schedules to accommodate working adults. All classes and program activities are conveniently located at the JHU Washington, DC Center (near Dupont Circle). Classes are offered in the evening or on Saturday so students do not need to break stride in their careers to attend.

Students who pursue the dual degree will take classes in the Government Program at the School of Arts and Sciences and in the MBA Program at the Carey Business School. They are assigned an advisor from each school who will oversee their course work. To earn the MA in Government/MBA students must take 10 classes in the Government Program and 20 classes in the Carey Business School. Students working full-time can take up to two courses a semester. Students who do not work full-time can take up to four courses a semester.

**ADMISSION REQUIREMENTS**

Please refer to the Center for Advanced Governmental Studies page for specific admissions requirements for the MA in Government/MBA Dual Degree Program.

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**PROGRAM INFORMATION**

**MA in Government Advising**
Dorothea Israel Wolfson
dorotheawolfson@jhu.edu
202-452-1123

**MBA Program Advising**
Andrea Johns
andrea.johns@jhu.edu
410.234.9289

**Prerequisites**

- GRE or GMAT exam*
- A grade point average of at least 3.0 on a 4.0 scale in the latter half of undergraduate studies; particular interests and work experience will also be considered.
- At least two years of progressive full-time professional experience after the completion of undergraduate studies.

* Admission to the MBA portion of the dual degree may require the GMAT or GRE. A waiver from these exams may be approved if a candidate has:

1. completed a graduate degree and can demonstrate quantitative ability through coursework of B or better in Statistics, Corporate Finance or Microeconomics.
2. completed an undergraduate degree and has at least five years professional experience. Applicant has also taken at least one course in Statistics, Corporate Finance and Microeconomics and earned a B or better and earned an overall GPA of 3.0 or better.
3. a professional designation such as CPA or CFA.

**Application Documents**

- AAP application and fee
- GRE or GMAT (if required)
- A current résumé
- Two letters of recommendation that verify professional
and/or academic accomplishments. Applicants must use the AAP form.

A statement of purpose (1-2 pages) is the most important document you are asked to submit. This statement should address your academic and professional goals.

A writing sample of 5-7 pages that is research focused. The purpose of the writing sample is to demonstrate your ability to make and support an argument.

If you do not have an existing research paper that you wish to submit, you may write a five-page paper on the following question:

“If men were angels, no government would be necessary. If angels were to govern men, neither external nor internal controls on government would be necessary. In framing a government which is to be administered by men over men, the great difficulty lies in this: you must first enable the government to control the governed; and in the next place oblige it to control itself.” – James Madison, Federalist 51

In this well-known quote Madison points towards the age-old problem of reconciling democracy and political power. Discuss this problem in reference to some recent policy issues or political events, citing at least three references.

Official undergraduate and graduate transcripts

International students must submit TOEFL scores and a “course-by-course” credential evaluation of their undergraduate transcript performed by an outside evaluation service.

CURRICULUM

All dual degree students are required to complete the following:

MA in Government Courses

1. 470.695 Proseminar: Essentials of Public and Private Management
2. 470.602 Government and Politics in the US
3. Eight additional Government courses
4. 470.015 Symposia (for more information visit advanced.jhu.edu/academics/graduate-degree-programs/government/the-experience/symposia/)

Although not required, the following courses are recommended electives for students in the dual degree program:

470.609 Leadership Skills in the 21st Century
470.616 The Law and Public Institutions
470.619 State Politics and Policymaking
470.622 Money and Politics
470.630 Government, Banking, and the Financial System
470.635 Presidential Policymaking
470.638 Negotiating as a Leadership Skill
470.645 The Budgetary Process
470.655 Multinationals and Government in the Age of Globalization
470.688 Political Institutions and the Policy Process
470.721 Business Law and Corporations in the Global Economy
470.728 Influence and Impacts of Nonprofits
470.730 Intellectual Property Law
470.736 Principles of Nonprofit Management
470.744 Trade and Security

Students wishing to earn a concentration must complete four of their electives in the concentration area. Concentrations are offered in Political Communication, Security Studies, and Legal Studies. For MA/MBA students, the thesis requirement is optional. If you wish to write a thesis, you must take 470.850 (Research and Thesis I), 470.852 Research and Thesis II and 470.800 Research and Thesis III. These three classes would count towards the 8 government electives you must take to complete the MA/MBA. MA/MBA students who successfully complete and defend their theses will be awarded Honors at graduation.

For details on these concentrations and a full list of classes and descriptions, see the AAP course catalog or web site: advanced.jhu.edu.

MBA Courses

All dual degree students are required to complete the following MBA courses (all courses are 2 credits):

120.601 Business Communication
121.610 Negotiation
131.601 Leadership Ethics Seminar
132.601 Business Law
142.620 Leadership in Organizations
142.730 Strategic Human Capital
210.620 Accounting and Financial Reporting
220.610 The Firm and the Macroeconomy
220.620 Economics for Decision Making
231.620 Corporate Finance
232.701 Investments
310.620 Information Systems
410.620 Marketing Management
510.601 Statistical Analysis
520.601 Decision Models
680.620 Operations Management
Five (5) Carey Electives

For more information, please contact Carey Business School Admissions carey.admissions@jhu.edu.

For MA in Government course descriptions, see page 144.
Master of Arts in Global Security Studies
globalsecurity.jhu.edu

COURSE REQUIREMENTS

- Four core courses
- Five elective courses
- Three thesis courses
- Symposia (for more information visit advanced.jhu.edu/academics/graduate-degree-programs/global-security-studies/the-experience/symposia)

For more information about core, thesis and elective courses, please see the course descriptions on page 120. Please note that not all courses are available each semester.

For information on exact dates, times, locations, fees and instructors for any particular term, students should consult the Advanced Academic Programs Course Schedule (advanced.jhu.edu) available several months before each semester or term begins. Courses are open only to students who meet enrollment requirements. All classes are held at the Johns Hopkins University (JHU) Washington, DC Center at 1717 Massachusetts Avenue, NW, close to Dupont Circle.

CURRICULUM

The curriculum of the JHU Master of Arts in Global Security Studies (GSS) is designed for working adult students who are looking to develop or expand their expertise in the challenges of security in the 21st century, with an eye to developing the perspective necessary to lead the formation of policy in this important area. Particular strengths of the program are in the role of intelligence in shaping security policy and the security environment; the influence of social movements, both armed and unarmed, in shaping the global security and economic environment; terrorism, insurgency, and other forms of “small wars”; and the emerging cyber domain and its implications for warfighting, security, privacy, and the economy.

Courses draw from the best in academia and policymaking, in order to offer students the cutting edge in intellectual preparedness for meeting the multifaceted challenges of attaining security in an age of complex economic interdependence, global energy and environmental challenges, and multifaceted military vulnerability.

Classes are designed to maximize individual attention, encourage student contribution, build analytical skills, and provide the tools for engaging in original research.

Sequence of Study
Students must take the core course, American National Security (470.606) in their first semester. Students should take Research and Thesis I: Global Security Studies (470.851) in about their third semester. Research and Thesis II should follow shortly after. The final required course of the program is Research and Thesis III, which students take after completing all other core courses and electives.

In addition to American National Security, there are three other core classes. Each reflects a key dimension of global security: strategic studies, economic security, and energy and environmental security. Students must also take five elective courses. Generally it is good practice to front-load the other core classes. However, the other cores and elective courses may be taken in any order.

Students may pursue an area of concentration in one of the fields listed below. An area of concentration requires that at least four of the elective courses be from the list approved for that concentration. All area of concentration courses also count as general electives for students not pursuing an area of concentration.

Thesis Process
The thesis is a portfolio of three papers that are thematically linked and written during the course of the student’s graduate school career. The papers are accompanied by an introductory critical comment of approximately 8-10 pages which elaborates on the contribution that these papers make to the existing literature and further addresses the way in which the three papers are interrelated.

During Research and Thesis I: Global Security Studies, students will study social science research and writing methods and begin to write the first paper of their thesis portfolio as well as develop a written prospectus for the portfolio as a whole. In Research and Thesis II: Global Security Studies, students will,
under the supervision of the thesis instructor, write and revise the second paper for submission that is appropriate for their thesis portfolio. By the conclusion of Research and Thesis I and II, all students will have at least two of their three required thesis papers completed. The third paper should be well under way in Research and Thesis II, also, but it can be reworked and revised during the remaining elective courses. Students will bring these three papers to their final class of the program, Research and Thesis III: Global Security Studies. In this course, students will work on any revisions to the three papers and write the introduction and conclusion that link the three chapters into a coherent whole. Students must successfully defend their thesis in order to graduate.

**CORE COURSES**

The four core courses provide an overview of the themes addressed by the GSS degree and the thesis module courses teach the methodology of social scientific inquiry. As noted above, students are required to take American National Security (470.606) in their first semester. Research and Thesis I: Global Security Studies should be taken in the second or third semester of study and Research and Thesis II: Global Security Studies should be taken in the final semester. Other cores and electives may be distributed as fits with the student’s schedule.

- 470.605 Global Political Economy
- 470.606 American National Security
- 470.692 Military Strategy & National Policy
- 470.773 Energy and Environmental Security OR
- 470.734 Energy, Vulnerability, and War

**THESIS COURSES**

- 470.851 Research and Thesis I: Global Security Studies
- 470.853 Research and Thesis II: Global Security Studies OR
- 470.709 Quantitative Methods *(with permission from instructor)*
- 470.804 Research and Thesis III: Global Security

**SAMPLE ELECTIVE COURSES FOR AREAS OF CONCENTRATION**

Students may (but are not required to) pursue an area of concentration in one of the fields listed below. A complete list of concentration courses is available on our website.

**Strategic Studies Concentration**

- 470.659 Radicalsation and Deradicalization in Terror Networks
- 470.665 Warfare by Other Means: Espionage and Covert Action in Foreign Policy
- 470.676 Understanding Islamist Politics and Terrorism
- 470.678 Nation Building as Security Policy
- 470.679 Armed Social Movements, Terrorism, Insurgency and Crime
- 470.693 Complex Decisionmaking in National Security
- 470.703 Cyberforce Superiority: Foundational Elements
- 470.704 Strategies in Insurgent and Asymmetric Warfare
- 470.711 Intelligence: From Secrets to Policy
- 470.713 Civil Resistance: The Logic of Strategic Nonviolent Conflict
- 470.722 Intelligence, War, and Political Conflict
- 470.740 Conflict and Security in Cyberspace
- 470.746 Understanding Contemporary Iran
- 470.751 Politics and Security in the Middle East
- 470.760 Comparative Intelligence Systems
- 470.761 Ruling the 21st Century: Economic Success, Military Strength, and the Rise and Fall of Powers
- 470.768 Nation Building as Security Policy
- 470.785 The American Way of War
- 470.797 Special Operations in a Strategic Context

**Energy and Environmental Security Concentration**

- 470.650 Government, Banking and the Financial System
- 470.724 Politics and Economics of Post War Reconstruction
- 470.744 Trade and Security
- 470.761 Ruling the 21st Century: Economic Success, Military Strength, and the Rise and Fall of Powers
- 470.768 Economic Growth: The Politics of Development in Asia, Africa and Beyond
- 470.771 Climate Change Economics

**Economic Security Concentration**

- 470.605 Global Political Economy
- 470.606 American National Security
- 420.614 Environmental Policymaking and Policy Analysis
- 425.645 Global Energy Policy
- 420.657 Environmental Issues and Congressional Policymaking
- 470.692 Military Strategy & National Policy
- 470.734 Energy, Vulnerability and War
- 470.771 Climate Change Economics
- 470.773 Energy and Environmental Security OR Policymaking
- 470.781 Development of Climate, Energy and Security Plans
- 470.792 Understanding, Adapting & Responding to Climate Change

**SAMPLE ELECTIVES**

Electives need to be chosen in consultation with the student’s advisor and should accommodate professional and/or personal goals. Students may also consider and take up to two of the relevant offerings of the School of Public Health, the School of Advanced International Studies, and of other programs in the School of Arts and Sciences.

These courses count toward the degree but not to any area of concentration. This is not a comprehensive list of electives; rather a sampling. All 470 courses count for the GSS elective requirement.

- 470.709 Quantitative Methods
- 470.725 China and America: Governance Alternatives for the 21st Century
- 470.739 Emergency Management and Communications
- 470.741 Democracy, Elections and US Foreign Policy
- 470.011 Graduate Writing Workshop
MA IN GLOBAL SECURITY STUDIES / CERTIFICATE IN INTELLIGENCE

Students pursuing a Masters in Global Security may obtain an additional credential by completing a sequence of courses offered by the Post-Baccalaureate Certificate in Intelligence. This combined credential will require students to complete 15 courses (in lieu of 17 to complete both degrees separately). Students are required to take the following courses:

MA in Global Security Studies Requirements:
470.606 American National Security
470.605 Global Political Economy
470.692 Military Strategy and National Security
470.773 Energy and Environmental Security OR
470.734 Energy Vulnerability and War
470.851 Research and Thesis I: Global Security Studies
470.853 Research and Thesis II: Global Security Studies OR
470.709 Quantitative Methods (with permission from instructor)
470.804 Research and Thesis III: Global Security Studies
Three electives.

Five Intelligence Certificate Requirements:
Completion of five courses, one each from the following areas (See Certificate in Intelligence for specific course options.)
> Introductory Courses
> Law and Ethics
> Theory, History, and Context
> Intelligence Operations
> Applications of Intelligence

MA IN GLOBAL SECURITY / CERTIFICATE IN GOVERNMENT ANALYTICS

MA in Global Security Studies Requirements:
470.606 American National Security
470.605 Global Political Economy
470.692 Military Strategy and National Security
470.773 Energy and Environmental Security OR
470.734 Energy Vulnerability and War
470.851 Research and Thesis I: Global Security Studies
470.853 Research and Thesis II: Global Security Studies OR
470.709 Quantitative Methods (with permission from instructor)
470.804 Research and Thesis III: Global Security Studies
Three electives.

Two Certificate in Government Analytics Core Courses:
470.681 Political Analysis and Statistics
470.709 Quantitative Methods

For course descriptions, see page 144.
Master of Arts in Public Management

publicmanagement.jhu.edu

COURSE REQUIREMENTS

> Five core courses including capstone
> Seven elective courses
> Symposia (for more information visit advanced.jhu.edu/academics/graduate-degree-programs/public-management/the-experience/symposia)

For more information about core and elective courses, please visit publicmanagement.jhu.edu. Please note that not all courses are available each semester.

For information on exact dates, times, locations, fees and instructors for any term, students should consult the Advanced Academic Programs Course Schedule (advanced.jhu.edu) available several months before each semester or term begins. Courses are open only to students who meet enrollment requirements. All classes are held at the Johns Hopkins University (JHU) Washington, DC Center at 1717 Massachusetts Avenue, NW, close to Dupont Circle. Some courses are offered online.

Please see the website for a comprehensive list of approved elective courses.

CURRICULUM

The MA in Public Management combines rigorous academics and strategic skills to meet the challenges of government and policymaking in the 21st Century.

While empowering students to be strategic, the program also educates them in the fundamentals of public management: financial management, policy analysis, economics, tax and budget policy, and public administration. Students learn to apply the latest theory, scientific findings, and new management methods to help solve real-world governance and policy issues.

The curriculum is designed for working professionals in government, the government-related sector, and nonprofits. Courses may be taken at a full- or part-time pace. At a time when governments and nonprofits at all levels are expected to do more with less, good management is essential. This innovative degree recognizes the interdependence of governmental and nonprofit sectors and their common ground in mission-driven performance.

The program prepares emerging leaders to face complex management challenges of today. Students will gain an appreciation for these issues through their core courses and their electives. Twelve courses, including a Capstone project, are necessary to complete the degree.

Sequence of Study

Students should make every effort to take the core course Public Policy and the Policy Process in their first semester. Students are strongly encouraged to complete the other core course requirement as early in their program of study as possible. The final required course of the program is the Capstone for Public Management, which students take in their final semester (students expecting to graduate at the completion of the summer semester may take capstone during the spring semester).

Capstone

The Capstone project enables students to apply and synthesize their knowledge, develop expertise on a topic related to public management, work closely with experts in the field, and improve professional writing and presentation skills.

In the semester prior to taking the Capstone course and conducting the project, students identify a project topic and mentor (optional). The mentor may be a faculty member teaching in the program, a supervisor from the student's place of work, or an expert with appropriate credentials.

CORE COURSES AND CAPSTONE

All students must successfully complete five core courses:

All students must successfully complete the following four courses:
470.608 Public Policy Evaluation and the Policy Process (formerly Public Policy and the Policy Process) 470.627 Financial Management & Analysis in the Public Sector OR 470.709 Quantitative Methods

PROGRAM ADVISING

Paul Weinstein Jr.
pweinst3@jhu.edu
202.663.5923

Sarah O’Byrne Ph.D.
obyrnes@jhu.edu
202.663.5985
470.631 Economics for Public Decision-Making
470.860 Capstone for Public Management

**ELECTIVES**

Electives need to be chosen in consultation with the student's advisor and should accommodate professional and/or personal goals. Students may also consider and take up to two of the relevant offerings of the School of Public Health, the School of Advanced International Studies, and of other programs in the School of Arts and Sciences.

**SAMPLE ELECTIVES**

470.616 The Law and Public Institutions
470.618 Congressional Policymaking
470.619 State Politics and Policymaking
470.621 Public Policy and Participatory Government
470.629 The Politics of Health Care Policy
470.630 Government, Banking, and the Financial System
470.634 Contemporary Terrorism and the American Response
470.635 Presidential Policymaking
470.638 Negotiating as a Leadership Skill
470.645 The Budgetary Process
470.646 Poverty Law and Social Policy in the U.S
470.660 Program Evaluation
470.667 The Administrative State: How Washington Regulates
470.670 The Practice & Politics of U.S. Tax Policy
470.674 Regulations: Law of Federal Agencies
470.684 Legislative Language and Policymaking
470.688 Political Institutions and the Policy Process
470.692 Military Strategy & National Policy
470.705 Global Political Economy
470.726 Education Policy and Federalism
470.728 Influence and Impact of Nonprofits
470.730 Intellectual Property Law
470.742 Models of Public Policy Analysis
470.744 Trade and Security
470.754 Global Climate Change and U.S. Energy Security
470.771 Climate Change Economics
470.773 Energy and Environmental Security
470.774 Nonprofit Governance and Executive Leadership
470.778 Federal Contracting Law
470.798 Financial Management and Analysis in Nonprofits

**MA IN PUBLIC MANAGEMENT / CERTIFICATE IN NONPROFIT MANAGEMENT**

Students pursuing a Masters in Public Management may obtain an additional credential by completing a sequence of courses offered by the Post-Baccalaureate Certificate in Nonprofit Management. This combined credential recognizes the interdependence of the governmental and nonprofit sectors and their common ground in mission-driven performance. Students who complete it will be prepared to move between the public and private, nonprofit sectors or work for agencies that span the two. This combined credential will require students to complete 16 courses (in lieu of 18 to complete both degrees separately). In addition to 6 electives from the Public Management curriculum, students are required to take the following courses:

**Four MA Public Management Requirements:**
470.608 Public Policy Evaluation and the Policy Process
470.627 Financial Management and Analysis in the Public Sector OR
470.709 Quantitative Methods
470.631 Economics for Public Decision-Making
470.860 Capstone for Public Management

**Six Nonprofit Certificate Requirements:**
470.728 Influence and Impact of Nonprofits
470.736 Principles of Nonprofit Management
470.774 Nonprofit Governance and Executive Leadership
470.798 Financial Management and Analysis in Nonprofits
470.623 Nonprofit Program Development and Evaluation
470.625 Resource Development and Marketing in Nonprofits

Note: If students want to transfer from the Post-Baccalaureate Certificate in Nonprofit Management to the Masters in Public Management, all six nonprofit courses would count towards their masters (one core and five electives).

**MA IN PUBLIC MANAGEMENT / CERTIFICATE IN INTELLIGENCE**

Students pursuing a Masters in Public Management may obtain an additional credential by completing a sequence of courses offered by the Post-Baccalaureate Certificate in Intelligence. This combined credential will require students to complete 15 courses (in lieu of 17 to complete both degrees separately). In addition to 5 electives from the Public Management curriculum, students are required to take the following courses:

**Five MA Public Management Requirements:**
470.695 Proseminar: Essentials of Public and Private Management OR
470.736 Principles of Nonprofit Management
470.608 Public Policy Evaluation and the Policy Process
470.627 Financial Management and Analysis in the Public Sector OR
470.709 Quantitative Methods
470.631 Economics for Public Decision-Making
470.860 Capstone for Public Management

**Five Intelligence Certificate Requirements:**
Completion of five courses, one each from the following areas (See Certificate in Intelligence for specific course options)
> Introductory Courses
> Law and Ethics
> Theory, History, and Context
Students pursuing a Masters in Public Management may obtain an additional credential by completing a sequence of courses offered by the Post-Baccalaureate Certificate in Government Analytics. This combined credential will require students to complete 15 courses (in lieu of 17 to complete both degrees separately). In addition to 5 electives from the Public Management curriculum, and 3 electives from the Government Analytics curriculum, students are required to take the following courses:

**Five MA Public Management Core Courses:**
- 470.695 Proseminar: Essentials of Public and Private Management OR
- 470.736 Principles of Nonprofit Management
- 470.608 Public Policy Evaluation and the Policy Process
- 470.627 Financial Management and Analysis in the Public Sector OR
- 470.709 Quantitative Methods
- 470.631 Economics for Public Decision-Making
- 470.860 Capstone for Public Management

**Two Certificate in Government Analytics Core Courses:**
- 470.681 Political Analysis and Statistics
- 470.709 Quantitative Methods

For course descriptions, see page 144.
Master of Science in Government Analytics
advanced.jhu.edu/govanalytics

DEGREE REQUIREMENTS

Students complete 12 courses to earn their degree.

> Five core courses (includes capstone project)
> Seven elective courses
> Symposia when taking on-the-ground courses (for more information, visit advanced.jhu.edu/academics/graduate-degree-programs/government-analytics/the-experience/symposia/)

For more information about core and elective courses, please see the course descriptions on page 122. Please note that not all courses are available each semester.

For information on exact dates, times, locations, fees, and instructors for any term, students should consult the Advanced Academic Programs Course Schedule (advanced.jhu.edu) available several months before each semester begins. Courses are open only to students who meet enrollment requirements. All on-the-ground courses are held at the Johns Hopkins University (JHU) Washington, DC Center at 1717 Massachusetts Avenue, NW, close to Dupont Circle. Select Online courses are also offered every semester.

CURRICULUM

The Johns Hopkins MS in Government Analytics prepares students to undertake sophisticated quantitative analyses to address political, policy and governance challenges. No prior coursework in quantitative methods is necessary.

Students will develop broadly applicable, foundational skills as well as expertise in statistical analysis, geospatial analysis, political behavior and policy analysis or public management. Twelve courses, including a capstone project, are required to complete the degree.

The schedule for completing the degree is flexible. Students in the Washington, DC area can attend classes on the ground at our Washington, DC Center, which is located near Dupont Circle. Classes are held on weekday evenings. In addition, anyone around the world can take classes online. All online courses are offered asynchronously, meaning students do not need to log in at a required time to take the course. Coursework is completed through weekly lesson modules that students log into at times that are convenient and within the course schedule. Students can choose to take some on-the-ground courses and some online courses.

SEQUENCE OF STUDY

It is recommended that students begin the program by taking 470.681 Statistics and Political Analysis followed by 470.709 Quantitative Methods. Students should then work through the additional core and elective requirements. The final required course, the Capstone Seminar, should be completed during the student's final semester.

CONCENTRATIONS

There are four concentrations offered through the MS in Government Analytics. The concentration in Statistical Analysis focuses on the use of statistics to make government-related decisions. The concentration in Geospatial Analysis focuses on the applied use of spatially distributed data. The concentration in Political Behavior and Policy Analysis prepares students to evaluate campaigns, elections, political institutions and government programs using quantitative methods. Finally, the concentration in Public Management provides students with the tools and skills needed to solve management issues related to policy, finance and administration. Pursuing a concentration is optional. To earn a concentration, four of the student's electives must be in the concentration area.

CAPSTONE

During the Capstone Seminar, students will develop and execute an original data analysis project. The purpose of this project is to address a political, policy or governance challenge through a thoughtful and rigorous data analysis. Students will present the results of their analysis in writing and offer actionable recommendations.

CORE COURSES

Students must take five core courses (including the Capstone Seminar):

> 470.681 Statistics and Political Analysis
> 470.709 Quantitative Methods
> 470.710 Advanced Quantitative Methods

> One of the following:
  > 470.673 Data Visualization
  > 470.660 Program Evaluation
  > 470.738 Time Series Models and Forecasting
  > 430.615 Big Data Analytics: Tools and Techniques

> 470.862 Capstone Seminar: Development and Execution of a Data Analysis Project

**ELECTIVES**

With approval of the program director, students may also choose electives from selected degree programs within Advanced Academic Programs, including Government, Global Security Studies, Applied Economics, Communication and Energy Policy and Climate.

**Sample Electives**

470.758 Data-Driven Campaigns and Elections
470.769 Data Science for Public Policy
470.743 Data Mining and Predictive Analytics
470.742 Models of Public Policy Analysis
470.708 Unleashing Open Data with Python
430.601 Geographic Information Systems
430.617 Demographics Modeling with GIS
470.631 Economics for Public Decision Making
470.627 Financial Management and Analysis in the Public Sector
470.645 The Budgetary Process

For course descriptions with a 430 prefix, see page 122. For course descriptions with a 470 prefix, see page 144.
Certificate in Government Analytics
advanced.jhu.edu/govanalytics/cert

COURSE REQUIREMENTS

Two core courses:
470.681 Statistics and Political Analysis
470.709 Quantitative Methods

Three elective courses in one or more of the following specialty areas:
> Statistical Analysis
> Geospatial Analysis
> Political Behavior and Policy Analysis
> Public Management

Students will work with the program director to determine which electives are appropriate for the student’s selected specialty area(s). For more information about core and elective courses, please see the course descriptions on page 122. Please note that not all courses are available each semester.

For information on exact dates, times, locations, fees, and instructors for any term, students should consult the Advanced Academic Programs Course Schedule (advanced.jhu.edu) available several months before each semester begins. Courses are open only to students who meet enrollment requirements. All on-the-ground courses are held at the Johns Hopkins University (JHU) Washington, DC Center at 1717 Massachusetts Avenue, NW, close to Dupont Circle. Online courses are also offered every semester.

CURRICULUM

The Johns Hopkins Certificate in Government Analytics provides students with the knowledge and skill set needed to perform sophisticated analyses, draw substantive conclusions and communicate results for the purpose of improving the function of government. No prior coursework in quantitative methods is necessary. Students will develop foundational skills as well as expertise in a specialty area of analysis. Five courses are required to complete the program.

The schedule for completing the program is flexible. Students in the Washington, DC area can attend classes on the ground at our Washington, DC Center, which is located near Dupont Circle. Classes are held on weekday evenings. In addition, anyone around the world can take classes online. All online courses are offered asynchronously, meaning students do not need to log in at a required time to take the course. Coursework is completed through weekly lesson modules that students log into at times that are convenient and within the course schedule. Students can choose to take some on-the-ground courses and some online courses.

Sequence of Study
It is recommended that students begin the program by taking 470.681 Statistics and Political Analysis followed by 470.709 Quantitative Methods. Students should then work through the elective requirements.

For course descriptions, see page 144

PROGRAM ADVISING
Jennifer Bachner, Ph.D.
Director
jbachner@jhu.edu
202.663.5831
Certificate in Intelligence
advanced.jhu.edu/intelligence

The new Certificate in Intelligence is designed for students who are interested in intelligence, whether as national security professionals or as citizens and taxpayers. It is especially useful for people seeking a job in the Intelligence Community or who are already in the community and wish to position themselves for advancement. The faculty are scholars and practitioners with many years of experience in the field. They will help students gain a sophisticated understanding of how the various intelligence disciplines work together, the intrinsic limits of intelligence, the legal, ethical and political issues involved in intelligence, and how intelligence relates to government policy and operations.

The Certificate can stand on its own as a credential or students can pair it with the Masters of Arts in Global Security Studies, Government, Government Analytics, or Public Management for a combined credential. (See the sections for those Master’s degrees for further details.) Students availing themselves of one of these options can count two of their Intelligence Studies courses toward their MA elective requirements.

ADMISSION REQUIREMENTS

> AAP application and fee
> Official undergraduate transcript indicating a minimum grade-point average of 3.0 on a 4.0 scale.
> Official graduate transcripts, if any.
> A current résumé
> Two letters of recommendation
> A statement of purpose outlining why you wish to study at JHU and how studying at JHU will help you realize your ambitions.

COURSE REQUIREMENTS

Students must pass one course from each of five categories:

Introduction
470.711 Intelligence: From Secrets to Policy
470.748 The Art and Practice of Intelligence

History/Theory/Context
406.667 Social Science, National Security, and Intelligence
470.624 Theory of Intelligence: Limits and Possibilities
470.680 The Rise and Fall of Intelligence
470.760 Comparative Intelligence Systems

Law and Ethics
470.650 Legal Issues in Intelligence and National Security
406.693 Constitutional Issues in National Security
470.696 Ethics and Privacy in Intelligence Operations

Operations
430.601 Geographic Information Systems (GIS)
430.602 Remote Sensing: Earth Observing Systems and Applications
470.665 Warfare by Other Means: Espionage and Covert Action in Foreign Policy
470.703 Cyberforce Superiority: Foundational Elements
470.719 Technical Collection of Intelligence
470.752 Intelligence Analysis

Applications
406.668 Intelligence and Counter-Terrorism
470.722 Intelligence and War

PROGRAM ADVISING

Mark Stout, Ph.D.
msout4@jhu.edu
202.663.5978

Course descriptions for Intelligence Studies courses are in other sections of this catalog. Please refer to the appropriate section.

> Courses with a 470 prefix are Global Security Studies (GSS) courses; see page 122.
> Courses with a 406 prefix are National Security Studies (NSS) courses; see page 179.
> Courses with a 430 prefix are Geographic Information Systems (GIS) courses; see page 101.

Please refer to the Advanced Academic Programs Course Schedule (advanced.jhu.edu) for exact dates, times, locations, fees and instructors. Courses are open only to students who meet admission requirements.

For course descriptions, see page 144.
Certificate in Nonprofit Management
nonprofit.jhu.edu

The fully online Certificate in Nonprofit Management recognizes the substantial role nonprofits play in the formulation and delivery of public services, and as vehicles for citizen influence and expression. The coursework focuses on building the specific analytical and management skills needed by those assuming leadership roles as executive staff or board members in a variety of nonprofit fields. All the courses feature a global perspective for relevance in today’s world of interconnected economies and communication.

For students already working in nonprofit subspecialties, such as arts and culture, health, environmental conservation or international development, the courses will show how their fields fit into the larger nonprofit sector and how the larger forces affect their own leadership and management challenges. The courses are also relevant for students pursuing careers in government agencies that require extensive interaction with nonprofits in the US or other countries.

For students in other countries, the courses offer a greater understanding of the role and potential of nongovernmental organizations and convey the best practices emerging from the American experience and from other countries with an advanced or growing nongovernmental sector.

Students are able to take courses at a full- or part-time pace. The curriculum is designed for working professionals in the government and nonprofit sectors who are looking to expand their expertise in nonprofit management with the latest skills and approaches taught by faculty at the forefront of their field.

COURSE REQUIREMENTS

Six online courses are necessary to complete the certificate, which students may complete on its own or in addition to any advanced degree program at Johns Hopkins University. The courses are:

470.728 Influence and Impact of Nonprofits
470.736 Principles of Nonprofit Management
470.774 Nonprofit Governance & Executive Leadership
470.798 Financial Management and Analysis in Nonprofits
470.623 Nonprofit Program Development and Evaluation
470.625 Resource Development and Marketing in Nonprofits

Students pursuing the formal certificate should complete “Influence and Impact of Nonprofits” and “Principles of Nonprofit Management” before enrolling in the four remaining courses. These two courses are offered each fall and spring semester.

ONLINE LEARNING

All online classes are offered as asynchronous learning experiences, allowing maximum flexibility in a student’s schedule. Course content is delivered mainly via text notes, voice-over PowerPoints, streaming video, and threaded discussions to provide a connection between students and faculty. Classes are kept small (15 students on average) to encourage active community building among fellow students and students and faculty. Pre-arranged real-time online meetings allow for direct access to faculty.

An orientation course introduces the students to the online learning tools and is required before taking the first online class.

For course descriptions, see page 144.
Governmental Studies Course Descriptions
Government, Global Security Studies, Public Management, Government Analytics, Intelligence, and Nonprofit Management

470.01 Graduate Writing Workshop
This intensive writing course offers students a foundation in essay composition and provides an in-depth review of sentence structure, grammar, and punctuation. Designed for those students who need to improve their writing skills, the curriculum in Graduate Writing Techniques examines the various techniques writers use to compose their sentences, to establish syntactic relationships within paragraphs, to draft thesis and transitional sentences, and to relate syntactic structure to ideas.

470.02 Directed Research
Non-credit; required (beginning Summer 2007) for those who have completed all of their course work including the Research and Thesis class, but are still working on their thesis. Details of this offering will be posted soon.

470.03 Introduction to Graduate Work in Government
This course is an introduction to graduate work and will not count toward your degree, but is designed to help students maximize their performance and excel in graduate studies. The course will combine class work with one-on-one advising and tutoring. The course will cover such topics as research, writing, citation, argument, using evidence, study habits, and managing a graduate-level workload. Teacher and student will meet at the beginning of the semester to assess areas of greatest need and tailor the course to meet them.

470.04 Government & Politics
This course is an introduction to government and politics through the study of the government of the United States. All governments combine coercion and legitimacy. In a stable and legitimate system of government, coercion is hardly noticed. Government comes to be seen as a source of benefits. The purpose of the course is to look behind institutions, practices, and benefits to appreciate how, for what, and for whom we are governed. We shall examine some of the major institutions of American government, some of America’s political processes, and some of the key forces competing for power in the U.S. to see how decisions in the areas of economic, social and foreign policy are reached. This is a core course of the Government Program but is open to all students.

470.05 Global Political Economy
In the wake of the financial crisis, bank bailouts, and stimulus plans, the relationship between American economic power and national security is especially salient. In this course, students investigate core topics in international political economy, analyzing the security implications of each. Topics include trade relations, international finance, monetary relations, poverty and development. (Core course for the MA in Governmental Studies)

470.06 American National Security
American National Security in the 21st Century encourages students to assess U.S. power and the factors that affect our ability to exercise power in the 21st century. The course provides a systematic overview of the complex global environment in which America pursues its interests, encompassing topics such as terrorism, weapons of mass destruction, conventional state-based threats, economic stability, civil war and more. (Core course for the MA in Global Security Studies)

470.08 Public Policy Evaluation & the Policy Process
This course is designed to introduce students to the public policy making process, to the basics of policy analysis, and to the substance of some of today's major policy debates. The first half of the course focuses on establishing a framework in which to analyze public policy formulation within the United States. The class also reviews the tools for developing and implementing policy. The second half of the course turns to policy analysis of some critical contemporary issues. Building on earlier readings, we will study current debates in economic/tax policy, education, health care, social security, and national security. This is a core requirement for the MA in Public Management. Formerly Public Policy and the Policy Process. Elective option for Govt. Analytics students.

470.09 Leadership Skills in the 21st Century
This course will assist leaders in identifying their personal approach to leadership; provide tips on motivating staff by building trusting relationships and shoring up their credibility; suggest influence and persuasion strategies that leaders need to employ when working with bosses, colleagues, direct reports, and critical stakeholders, including funding agencies; develop strategies to build effective work teams; and consider approaches to monitor organizational performance in an ongoing fashion.

470.10 American Political Thought
This course focuses on the development of these principles of equality and liberty, beginning with the founding period and ending with the “rebirth of freedom” at the close of the Civil War. In other words, we will examine the many crises along the way toward the realization of America’s principles, from the early debates over federalism and slavery, to the crisis of nullification, to the Civil War. Other themes will also be examined, including the development of American character
and democratic culture. We will study these themes through an examination of primary source materials.

470.611 American Conservative Political Thought
This course examines the different strands of American conservative political thought. Readings from Edmund Burke, Leo Strauss, Michael Oakeshott, Russell Kirk, T.S. Eliot, Friedrich Hayek, and others help students to delineate the intellectual foundations of modern conservative thought. Students focus on the trajectory of American conservative political thought from the founding to the present and compare Southern conservative, neoclassical, religious conservative, and libertarian writers.

470.612 Bureaucratic Politics
This seminar will examine the political support for bureaucracy, how bureaucracy functions in contemporary government and society, and selected current controversies over the purpose and reach of bureaucracy. How does bureaucracy enhance or frustrate liberal democratic ideals? We will take up case studies involving current political issues, such as civil rights enforcement, the war on terror, the role of regulatory agencies, judicial policymaking, relevant student experiences, and the instructor’s own experience in various federal and state agencies.

470.613 Managing Risk and Performance: Improving decision making in Government Agencies
The United States has experienced the most significant failure of its financial system since the Great Depression. Differences in governance and management between the survivors and the others are instructive not only for financial firms, but for government agencies and private companies in other sectors of the economy. This course seeks to present learnings that are potentially relevant to government managers and organizations. The basic lesson, of course, is that low probability events with devastating consequences do happen. Nicolas Nassim Taleb (2007) calls such events “black swans.” He argues that they take place much more frequently than people expect. Managers must take the possibility of black swans into account even when times are good; that’s one factor that distinguishes the survivors from the rest. The federal government and private sector have learned this from Katrina, the massive 2010 Gulf oil spill, homeland security events such as September 11, and the Great Recession that emerged from the financial crisis. All of these occurred within a single decade. Students will be expected to produce a research paper on an approved topic relating to (a) a crosscutting theme of governance and risk management at one or more private companies, (2) government regulation and supervision of risk management at one or more private companies, or (3) a cross-cutting theme of governance and risk management at government agencies. Students will be encouraged to make the course an interactive one and to share their personal knowledge of successes and failures of governance and risk management. The syllabus can be accessed from the Governmental Studies course descriptions webpage.

470.614 American Liberal Political Thought
This course examines the development of American liberalism, beginning with its intellectual foundation in 17th-century Europe and ending with contemporary American liberal thought. Readings are from John Locke, Jean Jacques Rousseau, Thomas Paine, Thomas Jefferson, John Stuart Mill, Woodrow Wilson, John Dewey, Franklin D. Roosevelt, Martin Luther King Jr., John Rawls, Betty Friedan, Ronald Dworkin, and others. Students consider what it means to be a “liberal” today.

470.615 Speechwriting: Theory and Practice
The theory and practice of speechwriting are the focus of our study of the great political speeches of all time and especially those of the American political tradition. We will examine the content, structure, and purpose of high rhetoric ranging from Pericles to Solzhenitsyn, from Abraham Lincoln, Frederick Douglass, and Franklin D. Roosevelt to contemporary politicians. Based on their knowledge of the best models, students will draft and deliver their own speeches.

470.616 The Law and Public Institutions
Since laws determine the missions of federal departments and agencies and their ability to carry out these missions, it is crucial that students of American government have a solid understanding of these laws. Focusing on specific institutions and cases, students become familiar with major laws, regulations, procedures, judicial decisions, and their practical consequences for the operation of the federal government. Students also investigate the relationship of government to the private sector.

470.617 The Courts and Public Policy
Americans traditionally have viewed the courts as—in the words of a constitutional scholar—“the least dangerous branch of government.” They are seen as reflectors, not agents, of change. But in an age of government downsizing, the role of the courts bears renewed examination. Students explore the historical and philosophical roots for the notion that American courts, and whether the lawyers who appear before them, can and should make law and policy, and the alternatives to this function. Students consider prominent areas of public policy that have been shaped by the courts, such as civil rights, family and domestic law, environmental and safety regulation, and the regulation of business and commerce. This course counts towards the Legal Studies Concentration.

470.618 Congress Policymaking
This course deals with the origins of legislation and how bills are processed through subcommittee, committee, and floor activities. Students are introduced to the many variables that influence the progress of a given bill. Students discuss House and Senate leadership and the ways in which congressional leaders contribute to overall policy outcomes.

470.619 State Politics and Policymaking
This course provides an introduction to the form and function of state governments around the United States and the issues they are currently facing. During the semester, the course explores the interplay between the U.S. Congress and State Legislatures, the ways in which policies enacted by state government impact our daily lives, and the intricacies of the political process at the state level. Special emphasis will be placed on key issues currently being debated in many state capitals pertaining to gay marriage, gambling, health care, higher education, transportation infrastructure and the environment. A visit to the Maryland General Assembly for a visit with the Governor and legislative leaders might be arranged.
470.621  Implementing Democracy: Public Action, Policy Tools, and Outcomes  
(formerly Public Policy and Participatory Government) 
This course will focus on the connection between democracy and public action and its impact on policymaking. The drive for more openness and transparency in government continues and is part of a set of relatively new policy tools primarily used as alternatives to regulation. Evaluating the choice and effectiveness of these policy instruments, and others such as disclosure, will allow students to identify and examine the criteria of “good governance.” The role of the public in the policymaking process and the new kinds of participation possible in the technologial age are examined as well. Case studies of policy areas such as healthcare, food safety, and environmental protection help to assess what more public involvement means for the policy process.

470.622  Money and Politics  
This course considers the historical and contemporary relationship between money and government. In what ways do moneyed interests have distinctive influences on American politics? Does this threaten the vibrancy of our representative democracy? Are recent controversies over campaign finance reform and lobbying reform signs that American government is in trouble? This course is reading, writing, and discussion intensive, and we consider the large academic literature on this subject, as well as the reflections of journalists and political practitioners. Election law and regulations on money in politics are always changing, and so part of the course is designed to give students tools at tracking these developments. The overall goal of the course is to foster an understanding of the money/politics relationship in ways that facilitate the evaluation of American democracy.

470.623  Nonprofit Program Development and Evaluation  
A major goal of this course is to help students become more proficient in recognizing, evaluating, and encouraging the kinds of benefits or outcomes intended by our society’s variety of nonprofit and public programs. We will examine what needs and opportunities are addressed by four major types of programs: those serving individuals, those serving communities, those serving networks or systems, and those serving other organizations. Evaluating each requires different lenses and different tools; we will explore the role of culture and context in choosing particular approaches to evaluation. A view of programs as interconnected rather than isolated will be encouraged. A second goal is to help students become more proficient in managing an evaluation process: we will explore purposes and uses of evaluation, the essential elements of an evaluation inquiry, and ways to communicate and use evaluation results. We will explore the variety of quantitative and qualitative strategies and a variety of useful strategies for evaluating progress in an organization’s attainment of its intended outcomes or benefits. Students can expect to become more proficient in discussing issues of nonprofit and public “program effectiveness” and strategies for improving nonprofit and public program designs. Core course for the Certificate in Nonprofit Management. Formerly Program Development & Evaluation in Nonprofits.

470.624  The Theory of Intelligence: Limits and Possibilities  
This course explores intelligence from a theoretical perspective to assess the ways in which persistent and emerging issues in the field help – or hinder – national and international actors in achieving policy objectives. The goal is to provide answers to several questions: “What is intelligence?” “How does it work?” “What difference does it make?” and “How do we know?” By investigating these questions, students will develop their analytical skills and increase their understanding of the workings of intelligence and security policies. The approach will be historical and topical, as well as theoretical. Students are not expected to begin with any particular expertise in deriving and applying theory; this class will teach what skills are needed. The history of intelligence offers a surprising number of illustrative cases and themes – many of which can now be examined in detail using official records and contrarian views, and can even be compared with analogues across nations and time periods. More-recent events are not as well documented in the public, official record, of course, but an understanding of earlier patterns and activities can provide valid insights on contemporary trends. The trends identified in the past and the present will then be explored for their ramifications for the future.

470.625  Resource Development and Marketing in Nonprofits  
The goal of this course is to prepare future nonprofit leaders and board members with the international resource development and marketing fundamentals that help every nonprofit thrive. The course focuses on how to create and nurture an organizational culture where everyone on the staff and board understands, embraces and acts on his or her role in developing strategic relationships with funders, potential funders, and media professionals. You will gain an understanding of the process, the metrics that drive the process, and the milestone markers that lead to success. You will explore how to develop a board and/or cadre of volunteers who give generously, share expertise freely, connect you to the right government officials and media leaders, and invite others to join them. Data driven decision making and all aspects of fund development, marketing and communications will be woven throughout the course. Led by an internationally recognized practitioner, consultant and master teacher, the course will use scenarios, discussion, social media, audio and video clips so that you will walk away with the knowledge you need to secure private and government funding, and social capital as a CEO, senior staff member, board chair or member, and the confidence to do it all well. Core course for the Certificate in Nonprofit Management. Formerly Resource Development and Marketing in Nonprofits.

470.626  Understanding the Media: Old and New  
No one who works inside the beltway, whether in government or the private sector, can escape the impact of the mass media. This course helps students understand the role and practices of the news media. It teaches critical skills in analyzing and interpreting the news and in assessing its impact on government and public policy. Students explore media ethics and First Amendment issues and hear from several guest lecturers who share their expertise.
470.627 Financial Management & Analysis in the Public Sector
The primary emphasis of this class will be to teach students how to make more informed business decisions through the use of financial management accounting information. Management accounting is concerned with the information provided managers to plan, manage control and assess an entity's activities and performance. Managerial accounting concepts are universal, and can be applied to service, government and non-profit organizations. This class assumes no formal exposure to management accounting (or financial accounting for that matter) and as such will focus on how to organize and use information to run/measure/operate a public entity or program. Core course for the MA in Public Management. This course counts towards the Economic Security concentration (CSS). Elective option for Govt. Analytics students.

470.628 Parties, Campaigns, and Elections
Situating recent elections in broader historical context, this course examines the structures, activities, and functions of American political parties and their roles in campaign and electoral processes. What strategies do parties employ and how are individual campaigns organized? What roles do ideology, interest, and party organization play in connecting political elites and mobilizing voters? How do political parties function in an electoral context increasingly dominated by candidate-centered campaigns, mass media politics, professional consultants, and independent voters?

470.629 The Politics of Health Care Policy
This course introduces students to the political actors and influences that determine the nature of health care policy. Particular emphasis is placed upon the following areas: the debate over public versus private provision of health care; the availability of health insurance; health promotion; harm reduction; the role of alternative and complementary medicine; and proposed reforms to the current system, from adoption of a so-called “single payer” system to medical and health savings accounts. The obesity epidemic is featured as a real-time case study in the interaction between science and politics. To improve their ability to perform comparative analysis, students are introduced to other nations’ health care systems. Particular emphasis is placed upon Canada’s Medicare system and the United Kingdom’s National Health Service.

470.630 Government, Banking, and the Financial System
Credit markets are in turmoil and policymakers fear a spillover to the larger economy. Policymakers are rushing to enact changes in the mortgage market and for credit cards, student loans, and other credit products. We will look at key issues: Why did lenders make many loans that borrowers could not repay? How does the subprime mortgage market work? What about the rest of the mortgage market? What are special needs of low-income and first-time borrowers? How do credit rating companies work? What protections do consumers need? How do we deal with many homeowners facing foreclosure? What are benefits and costs of reform proposals?

470.631 Economics for Public Decision-Making
Economic thinking provides an important set of tools for almost every aspect of public policy making. This course aims to offer students a basic understanding of economics and its importance in public policy making. The first half of the course will offer students an understanding of microeconomic and macroeconomic theory including a discussion of when markets can work to achieve policy goals and when “market failures” call for government intervention. The second half of the class will use these economic tools and theories in order to survey several specific policy areas— including health policy, tax policy, and the national debt. Core course for the MA in Public Management. This course counts towards the Economic Security concentration (CSS). Elective option for Govt. Analytics students.

470.634 The Rise of Violent Islamist Extremism and the American Response
This course will examine the effort of the United States and its Western allies to collect on, analyze and assist in the defeat of modern, violent Islamist extremism—specifically terrorism committed by al-Qa’ida and its associated networks. The course will first examine definitions of terrorism, the rise of modern Islamist Radicalism, extremism and counter messaging such extremism. The second component will be an examination of modern, terrorist interest in WMD (in particular al-Qa’ida’s interest in acquiring nuclear, chemical and biological weapons), as well as concepts of ‘terrorist WMD employment doctrine’ and US efforts to combat WMD-Terrorism. The third component will be an examination of ‘cyber terrorism’—its definitions, how it could occur, and what the United States can and cannot do to prevent it. The final, fourth component of the course is an examination of the debates surrounding intelligence reform as it relates to US counterterrorism efforts.

470.635 Presidential Policymaking
(formerly Executive Politics and Policymaking) The founders may have envisioned Congress as the premier branch of the federal government, but in the 20th century the president and the executive branch have typically occupied that position. This course examines presidential and bureaucratic power in the American political system. Students explore the political and policymaking dynamics at the top executive levels and within the bureaucracy. They also investigate the factors that account for variations in the power exercised by officials and consider the relationship between the executive branch and other centers of power in American politics. Finally, students will learn the processes and tools utilized by policymakers in the executive branch.

470.636 Political Communications: The National Stage
This course teaches the skills to both participate in and understand modern media and examines how communications influence public opinion. Guest speakers with senior-level experience in modern communications policy will discuss their roles in how the media and communication strategies influence public opinion. The course will address competitive writing, communications strategy, communication planning and execution, news analysis, and basic rules of media relations. A comparison of executive and legislative branch communications and strategies, the importance of visuals in modern communications, and how communications has changed over time will also be examined.
470.637 Lobbying and Influence
This course will explore the role of interest groups and lobbyists in the American political process. We will discuss the basics of the policymaking process, with a particular focus on how policymakers respond to different outside pressures. We will examine the ways in which these outside pressures (the lobbyists) try to influence the policymaking process, and what determines whether or not they are successful. We will investigate whether the tens of thousands of lobbyists roaming the streets of Washington improve or detract from the quality of American democracy. Students should expect to come away from this class with a greater understanding of why we get the political outcomes we do, and some ideas about how they might be able to change those outcomes, should they want to get involved.

470.638 Negotiating as a Leadership Skill
Conflict is part of organizational life. People in public sector agencies and nonprofit and for-profit organizations disagree over the meaning of regulations, the use of financial resources, office space, leave time, and many other issues. Managers must have the ability to diagnose disputes and to negotiate effectively to resolve conflicts. This course provides the theoretical background and conceptual framework needed for successful negotiation and mediation. Through presentations and discussions students become familiar with the tools necessary for conflict resolution in their agencies and organizations. Analysis of a party's interests, identification of the necessary style, awareness of communication skills, and planning and feedback are part of the process of becoming an accomplished negotiator.

470.639 Open Government: Transparency, Technology, and Citizen Engagement
We acknowledge that people all around the world are demanding more openness in government. They are calling for greater civic participation in public affairs, and seeking ways to make their governments more transparent, responsive, accountable, and effective. “So reads the Open Government Declaration, signed by 57 countries, including the United States. This class is an exploration of what it means for governments to become more open. Big question include: What do we mean by “open”? What role does technology play? What happens when governments open up? What is the role of citizen engagement? How transparent should government be? Our discussions will range from the municipal to the national to the global stage. Students should expect to come away from the course with a better understanding of the promises and limits of open government, as well as some frameworks for implementation.

470.640 The Media And Politics
Will the media rule the next presidential campaign? With firsthand testimony from veteran reporters and political operatives, this course will illuminate the interaction of journalism and politics that has transformed the way Americans choose their presidents. The lectures and readings will demonstrate that practitioners of both professions bear responsibility for the flaws of the modern system. From the seminal year of 1968 to the Bush-Gore cliffhanger of 2000, students will analyze the lessons of past struggles for the White House and use them as a prism for viewing the early skirmishes of the incipient campaign of 2004 and, more broadly, as a guide to a fuller understanding of national politics.

Today's federal reliance on private contractors to perform the basic work of government is neither an accident nor a recent development. It is the predictable and predicted product of a great mid-20th century reform in American government. This course will examine the past and the present of this ongoing reform, place it in historical and comparative (cross-country) perspective, and provide students with an opportunity to consider and debate the paths that Congress, the President and citizens may take to assure that the public interest is served as private actors increasingly perform the work of government.

470.642 Muslim Politics and American Interests
This course explores the governance and politics of Muslim countries and evaluates US strategic interests in those countries in light of their domestic politics. Students will compare and contrast how different Muslim countries deal with issues such as individual liberty, secularism, the role of women in public life and democratic participation. We focus on two main questions: what accounts for the wide variety of outcomes in the Muslim world on these issues and what implications does this diversity have for U.S. foreign policy options? During the course of this investigation, we will touch on the politics, economics and society of Saudi Arabia, Iran, Pakistan, Indonesia, Egypt and Turkey; and will explore examples from other Muslim states and societies as well.

470.644 Democracy and Its Modern Critics
Much of international politics in the last century can be described as a conflict between liberal democracy and its modern critics. During this period the values and political structures of liberal democracy have been extended to more parts of the world than ever before. Yet the same era also saw the emergence of powerful challengers to liberal democracy from both the right and the left. The resulting clash of ideologies defined such conflicts as World War II and the Cold War. In this course we will survey the intellectual roots of Fascism, National Socialism, and Communism. We will also examine the question of Islam and democracy looking at both its proponents and its radical critics in the Islamic world. Among those whose writings we will examine are Karl Marx, V.I. Lenin, Benito Mussolini, Carl Schmitt, Charles Maurras, Syed Qutb, Ali Shariati, Muktedar Khan, and Ruhollah Khomeini. This course counts towards the Security Studies concentration.

470.645 The Budgetary Process
The federal budget process is an enormously complex mixture of administrative routines and mechanisms designed to bias decisions, avoid blame, or reduce conflict. This course explores the structures of federal budgeting in terms of its varied goals and in the context of the wider governing process. The course will review the budgetary process in both the executive and congressional branching, as well as the interaction of those two systems. In order to gain understanding of the difficult policy choices and political pressures policymakers face, students will be asked to do a simulation of a budget process within the executive branch. The role of entitlements, scoring issues, and tax policy will be examined in the context of the debate over budget policy. The course will start with a short primer on finance theory. Elective option for Govt. Analytics students.
470.646 Poverty, Inequality, Opportunity: Theoretical Foundations and Policy Implications
This course examines enduring issues in political theory – including poverty, inequality, opportunity, citizenship, compassion, obligation, justice, and the role of government, markets, and charity - and their expression in contemporary social policy. The course provides foundations for understanding the theoretical and political dimensions of social policy and the implications for policy solutions.

470.648 Europe and the Birth of Modern Democracy: Scotland and Paris
It will be the goal of this course to explore the roots of liberal democracy, focusing in particular on the development of the free market and religious toleration. Two distinctive approaches can be discerned, one represented by the liberal-democratic movement in Great Britain and the other in France. The British version of liberal democracy is characterized by its embrace of reason, but reason tempered by the “moral sentiments.” It was also more focused on economic questions as with Adam Smith’s advocacy of the free market. In contrast, the French Enlightenment represented a more full-throated and radical embrace of reason leading to the critique of supernatural religion and the advocacy of secularism as the path to achieve liberty, progress, and toleration. Together these two models of democratic development have decisively shaped modern political culture in Europe, the United States, and newly emerging democracies. Our course will focus on the intellectual origins of these foundational ideas. The course will also examine contemporary political issues impacting Europe, such as the law of laicite (secularism) in France, the Scottish separatist movement in Great Britain, in addition to the impact of the new immigration on liberal democratic institutions in Europe.

470.649 Behind the Numbers: Polling and American Elections
“(formerly Politics of Government Reform) This course considers a fundamental characteristic of American constitutionalism: the manner in which ambition is made to counteract ambition in our constitutional structure. Students will undertake advanced study of the nature and scope of the constitutional powers of the three branches of the federal government and their relationship to, and interactions with, one another. The course will consider judicial review and the authority of Congress to place limitations upon court jurisdiction, as well as conflicts between the President and the Congress. In particular, significant time will be devoted to interbranch controversies concerning the content and execution of federal legislation, control of the administrative state, fact-finding and investigative oversight, the allocation of foreign policy and war powers, and impeachment. The course will draw on lessons from constitutional case law and historical materials, and will encourage students to contemplate the role of both the courts and the political process in resolving disputes between the branches. Elective option for Govt. Analytics students.”

470.650 Legal Issues in Intelligence and National Security
This class will examine the interplay between the laws and the practices and policies of the United States’ Intelligence Community and national security system, both foreign and domestic. While discussion of the history of intelligence activities and laws dating from the origins of our colonial days will necessarily shape the framework of the class, the focus shall particularly be on current debates and challenges faced by the United States in the 21st Century.

470.651 Corruption and Other Pathologies Of Government
A disturbing number of governments in the world are bad; they are corrupt, tyrannical, incompetent, or destructive. Authoritarian, self-serving leaders misallocate national resources, steal elections, terrorize citizens, and line their own pockets. Social programs are neglected and the will of the people ignored. Corruption becomes a way of life. Democracy and the rule of law are frustrated, and pathological policies and practices are made legal. Regulations, instead of protecting the public, become instruments of tyranny and petty bureaucracy. How do these things happen? How do we tell them when and why governments become “pathological”? The nature of such pathologies will be examined and frameworks for evaluation presented, drawing on theoretical work, as well as real-life international examples and case studies from the U.S. and around the world. Most important, the course will analyze how government pathologies can be prevented, mitigated, or resisted. Various practical means for the detection and reduction of corruption will be examined.

470.652 Primaries, Caucuses, Conventions and the General Election
Valuable lessons can be learned about governing from the experience of other countries as, for example, from the radical changes in the former Soviet bloc, the evolution of less developed countries, and the extraordinary experiments in government in China, India, and Russia. This course deals with the crucial problems of public management, including economic development, social services delivery, public regulation, and performance of governments themselves. Students compare U.S. practices with those in other countries, and discuss the practical problems of delivering public services in environments far more difficult than in the U.S. Students examine new approaches to government efficiency, shifts of roles to the private sector, intergovernmental devolution, and management innovation as they are tested in governments around the world.

470.653 Contemporary Russian Politics
When the coup aimed at saving the Soviet Union collapsed in August, 1991, a Russian literary critic said, “For the first time in this century, God has smiled on Russia.” This course will examine the fall of the Soviet Union, perhaps the most important event of the second half of the twentieth century, and the rise of the new Russia. Beginning with an explanation of the ideas that gave rise to communism, it will examine the nature of the Soviet Union, the sources of its power and also its critical although often ignored weaknesses. It will also examine the fate of post-Soviet Russia, including the rise of organized crime and the authoritarian regime that exists today. The course will consider the meaning of the Russian attempt to create “heaven on earth,” which has lessons for dealing with the religious fanaticism that threatens the world today, as well as the requirements of a transition from totalitarian domination to a system that is democratic in more than just name.
470.655 Multinationals and Governments in the Age of Globalization
In this course, the main themes and issues that characterize the relationship between the issues of development, democracy, and globalization are introduced and examined. The first part of the course focuses on the issue of development and investigates issues such as whether there is such a thing as political development in the same way as we think about economic development. The second section of the course explores whether the process of economic development actually fares better or worse under democratic regimes and if in fact there is any necessary connection between democracy and successful economic development. In the third and final part of the course, students analyze globalization as the spread of integrated markets, increasingly mobile capital, and common economic policies and practices and ask whether this “new” world economic order enhances or inhibits prospects for development and democracy.

470.656 Presidential Power and Politics
This course is intended to expose students to various approaches political scientists have taken to the study of the American presidency. It will also focus on institutional contributions various presidents have made to the contemporary office. In addition to the assigned texts, the instructors and the students will pay attention to the 2009 presidential contributions and key developments during the 44th president’s “first hundred days” and beyond.

470.657 Politics, the Media, and Presidential Campaigns
When it comes to electing a president, how well do the news media play their part? This course will attempt to answer the question by monitoring day-to-day coverage of the 2008 presidential election as it unfolds. News and political professionals involved with the campaign will debate their roles and responsibilities. The course will look at how well the news media are doing in providing essential information on the candidates and the issues facing the nation they aspire to lead. Once the election is over, the course will critique the overall coverage and suggest what needs to be changed for the next election. Students will make case studies with special scrutiny given to what happens when the media itself become an issue in the campaign. The course will review the coverage of the pre-primary and primary campaigns and utilize selected readings and news clips from previous elections to illuminate the 2008 campaign.

470.658 Religion and American Political Culture
The relationship between religion and politics in the American context is one of peculiar complexity in the American context. This course has 3 main objectives: 1) to examine in general terms the role of religion in American public and political life as reflected in the debates concerning the use of religious symbolism and discourse in the public sphere; 2) to analyze how religiously informed moral argument has helped to shape public debate on key issues of public policy including the issues of civil rights, abortion, war and peace, and economic policy; and 3) to provide the necessary historical and philosophical context to help understand the present day intersection of religion and politics, and to see how previous generations of Americans approached similar problems.

470.659 Radicalization and Deradicalization in Terror Networks
This course will explore some of the most contested and controversial aspects in contemporary security studies. There are a number of contentious and wide-ranging debates around ideas like radicalisation – not least concerning its definition, causes, and effects. This course will also prompt you to consider broader issues, such as whether there is a causal link between extremism and violent extremism? Why do some radicalised individuals to embrace terrorism, when other don’t? And should security officials concern themselves with radicalisation, or only with its violent offshoots? This course will unpack many of these debates, exploring academic and theoretical literature surrounding the issues of radicalisation, recruitment, and deradicalisation in modern terrorist networks. It will focus primarily on cases in Europe and the United States, while also exploring new phenomena such as ‘homegrown’, ’self-starter’, and ‘lone wolf’ terrorism.

470.660 Program Evaluation
Program evaluation comprises a set of statistical tools for assessing the impact of public interventions. This methodological course will develop students’ understanding of causal inference and skills in quantitative program evaluation. Students will study a variety of evaluation designs (from random assignment to quasi-experimental evaluation methods) and analyze data from actual evaluations. Students will learn to be critical consumers of paper and reports, but will also develop the skills necessary to produce empirical research. The prerequisites for this course are Quantitative Methods and Statistics and Political Analysis.

470.661 Constitutional Law
This survey course is designed to introduce students to the foundations of our constitutional system and constitutional analysis. Discussions will focus on the law as well as related policy, political, and societal implications of constitutional interpretation. The course will explore such areas as the roles and powers of the branches of federal government, separation of powers, federalism, and the commerce clause. It will also cover individual rights, due process, equal protection, church and state, and economic liberties.

470.662 Religion, Conflict & Peacebuilding
The ‘war on terrorism,’ the wars in Iraq and Afghanistan, seemingly persistent religious-ethnic-nationalist conflicts, and the rise in sectarianism in the Middle East call for an essential reexamination of the role of religion in conflict, as well as the moral norms governing the role of military force. This course explores the role of religion, ethics, and culture in conflict and peace-building. In doing so, it brings together two topics that are often addressed separately in the literature: religious and philosophical perspectives on the ethics of the use of force, and the role of religion in conflict. By showing that the two topics are intimately related, this interdisciplinary course also shows how theological and ethical perspectives interact with those of sociology of religion, political science and religious studies. In the first part of the course, we will develop a general framework for assessing the nature and causes of contemporary conflicts; the role of religion in world affairs; the major normative approaches to the use of force; and the role of religion and religious norms in promoting and preventing conflict.
The second part then addresses particular issues, including terrorism, preventive war, humanitarian intervention, the conduct of war, and post-war reconciliation.

470.663 China's Place in the 21st Century
One of the major foreign policy challenges facing the United States in the 21st Century is responding to the rise of China. It is a challenge fraught with uncertainty because it is difficult to discern precisely what kind of power China intends to be. Ironically, China faces much the same question itself: what role does it wish to play in the world? In what kind of international system does it wish to play that role? And does it have the national power of all types to support its grand strategy? The course will address these questions, combining classroom instruction in Washington with on-the-ground time in China and interactions with Chinese scholars, business leaders, and officials.

470.664 Global Net Assessment: Tracking and Bounding World Crisis
Net assessment began during the Cold War as a threat-based framework for analyzing the national security strategy of the United States. Yet the idea of a holistic approach to strategic threats transports well to other big challenges. Perhaps the biggest challenge we face is a world system crisis in which the global network of networks is overstressed. Such a crisis is not hypothetical: world networks have broken down many times before. Moreover there is a great deal of stress building up in the world system today. The goal of the course is to identify the dynamics of world system stress in the near-to-mid-term, and postulate how the mechanisms that produce this stress might interact to precipitate a global crisis. We will examine several historical case studies, as well as a range of threats to global networks, culminating in the class-development of models to identify both strategic warning indicators of crisis and potential pathways for the emergence of world crisis.

470.665 Warfare by Other Means: Espionage and Covert Action in Foreign Policy
This course focuses on clandestine operations and covert action, a part of the world of strategic intelligence. It explores these subjects both conceptually and historically, covering the philosophy and the mechanics of such operations, as well as how they have been used over time, including the World War II era, the Cold War, and the post 9/11 world. Students will drill down into case studies that lead to a kind of cost-benefit assessment of various types of clandestine operations and covert action. By the end of the course, students will be able to run their own policy calculus, assessing the advantages and disadvantages of clandestine operations and covert action for national security.

470.667 The Administrative State: How Washington Regulates
The regulatory process is neither simple nor straightforward. Congress writes the laws, which authorize or require the federal agencies to act (or prohibit them from acting). This course will explore why Congress delegates to the agencies, how much it may delegate, and how it influences the use of the power it has delegated. Most of the federal agencies are in the executive branch of the government, headed by the president; the rest are so-called independent regulatory agencies. How much authority does the president have in appointments and removal and in policy guidance, and what means does he use to exercise that power? What are the procedural requirements the agencies must follow in developing regulations? What are the substantive requirements (e.g., the role of science and economics)? What influence does the public have, including the general public, the states and local governmental entities, and the special interests? The course will conclude with the role of the courts, which ultimately must decide questions of statutory interpretation and constitutional law.

470.668 The Politics and Process of American Foreign Policy
Overuse is not the only problem with the maxim that American “politics stop at the water’s edge.” The slogan has simply never been true. American foreign policy has always been a result not just of the crises and opportunities the nation has faced but its unique politics and policy processes. American national interests are determined through the democratic processes established by the Constitution and other legislation and affected by the politics that drive the nation’s elections, its conversations and its foreign policies. These politics and processes have been remarkably consistent since the founding even as the nation’s interests have grown significantly. A better understanding of both the politics and processes of American foreign policy will help students appreciate how the country’s policies are made today and will be made in the future.

470.670 The Practice & Politics of U.S. Tax Policy
Benjamin Franklin famously observed that “nothing can be said to be certain, except death and taxes.” Since Franklin’s day, however, both the form and prevalence of taxation has undergone a dramatic global transformation. This course will review the history of U.S. federal taxation and delve into the practical mechanics of taxation. It will provide students with an understanding of the processes, institutions, and political influences that shape tax policy. Finally, it will examine alternative methods of taxation and consider what the future may hold for federal tax policy.

470.671 Criminal Law and Constitutional Procedure
This course will survey major themes related to substantive criminal law and to constitutional criminal procedure. The first portion of the course will consider the government’s constitutional and political authority to control undesirable behavior by defining criminal law. Through the use of doctrine, case law, and illustrative crimes such as homicide, rape, and theft, the course will examine the criminal act, intent, causation, attempts and inchoate offenses, justification and excuse, and competing rationales for and theories of criminal punishment and sentencing. The second portion of the course will examine the Constitution’s procedural limits upon the government’s ability to investigate and detect crime. This will include study of searches and seizures, confessions and interrogations, and provisions for the right to counsel, as expressed in the Bill of Rights and Fourteenth Amendment and articulated in the opinions of the United States Supreme Court.

470.672 Statecraft and Soft Power
"Statecraft and Soft Power" deals with the growing role of soft power in world affairs. We will analyze how states, particularly the U.S., are responding to major contemporary issues through
public diplomacy, foreign assistance and increased partnerships with NGOs. The course will help participants develop skills applicable in several career fields, ranging from analysis of public opinion, media and culture, to strategic planning and effective communication. We will also discuss other elements of soft power such as foreign assistance, the conduct of exchanges and capacity building. The course will include decision making simulations and workshops in strategic planning and crisis management.

470.673 Data Visualization
This course instructs students in various visualization techniques and software. Students will learn how to: (1) ask interesting questions about politics, (2) identify data that can be used to answer those questions, (3) collect, clean and document the data, (4) explore and analyze the data with statistical and graphical techniques, (5) create compelling, informative and accurate visualizations and (6) present these visualizations to educated audiences. Option for a Government Analytics core course.

470.674 Regulations: Law of Federal Agencies
This course will cover the laws governing the operation of the federal executive branch of government. It will explore the legal bases for the ever-expanding role of federal agencies in society and the ramifications of continuing or limiting the growth of executive branch authority. The course will emphasize practical, on-the-ground challenges faced by federal agency leaders attempting to shape policies within the confines of laws adopted by Congress. The course will focus on: 1) the sources of basic legal authority of agencies – found in the US Constitution, federal laws and executive orders; 2) landmark cases testing the boundaries of authority of the executive branch and unique authority and roles of some regulatory agencies; 3) the roles of federal agencies in rulemaking, enforcement, and adjudication of disputes, and their relationship with Congress and the courts. Class discussion will center around the cases that have shaped the development of federal administrative law and consider the hurdles and controversies currently faced by federal agencies in administering laws adopted by Congress. For their final paper, students will select a current topic or controversy regarding federal agency action and explore its legal underpinnings, short and long-term implications for society, and assess whether the law should permit/prohibit/limit the federal action being considered. The paper will be developed in several stages over the course of the semester. This course counts towards the Legal Studies Concentration.

470.675 Politics, Language, and Culture of the Arab World
An introduction to Arabic politics, language, and culture as a foundation for understanding today’s Arab world. This course provides students with an introduction to Arabic language and an appreciation of Arab political and economic structures, literature and art in the light of recent political, economic and social changes.

470.676 Understanding Islamist Politics and Terrorism
Since the 1920s, Islamist groups have used violent and non-violent methods to shape the political destinies of Muslim-majority countries. Typically, these groups are studied in isolation from one another but in reality they form an entire ecosystem in constant communication and competition with one another and with outsiders. This course will explore the interactions of Islamist groups and attempt to discern the key factors that drive their political behavior. We will survey what the classical Islamic tradition has to say about politics; detail the three dominant ideologies of Sunni Islamist political actors (Deobandism, Salafism, and the Muslim Brotherhood); and look at a series of country case studies. Upon completion of the course, students should be able to identify the major trends of Islamist activism in a Muslim-majority country and explain why the local Islamist groups behave the way they do.

470.678 Nation Security Leadership
The purpose of this course is to analyze the civilian and military leadership of the principal departments and agencies of the government which are responsible for the nation’s security. Attention will be placed upon the processes through which civilian (senior and mid-level political appointees, Civil Service) and military leaders are selected and evaluated, the major leadership and management challenges currently facing leaders, culture and competence clashes and the inevitable tension in the civilian-military relationship, and efforts to improve professionalism in a rapidly changing security environment. An important objective is to inform the students on the legal, political, operational, budgetary, and other factors which influence senior officials in the making of defense/homeland security strategies and policies and on the decision-making methodologies employed.

470.679 Armed Social Movements: Terrorism Insurgency and Crime
Drawing on the social movement literature, this course examines the emergence of irregular armed groups and their decisions to use violence. It explains how social movements turn violent, how violence dictates their nature, and what this nature can tell us in terms of group strengths and weaknesses. It provides the students with the analytical tools needed to distinguish between terrorism, insurgency, and crime – by focusing and understanding group strategies, behavior, and capabilities. Students will thus be familiarized with the theory on armed group formation and evolution – but the course goes further, by counterposing such theory to the complexities of practice through the consideration of key case studies. The course ends with an overview of state strategies intended to counter a wide variety of threats. Particular attention is paid to the notion of operational art and lines of effort to underline the potential and meaning of counterterrorism and counterinsurgency.

470.680 The Rise and Fall of Intelligence
This course emphasizes recent changes in US intelligence and assesses the ways in which persistent and emerging issues in the field are helping or hindering the United States in achieving policy objectives. The goal is to provide answers to three questions: “How does US intelligence work in the modern world?”, “What are the larger dilemmas facing US intelligence overseers and those who use intelligence?”, and “How are these realities likely to shape the future of the Intelligence Community?” The approach will be both historical and topical. The history of intelligence offers a surprising number of illustrative cases and themes—many of which can now be examined in detail using official records and contrarian views,
and can even be compared with analogues across nations and time periods. More-recent events are not as well documented in the public, official record, of course, but an understanding of earlier patterns and activities can provide valid insights on contemporary trends. The trends identified in the past and the present will then be explored for their ramifications for the future.

470.681 Statistics and Political Analysis
Introduces students to the concepts central to social science research design and methods used to summarize and present quantitative data. Applications using political and public policy data will be featured. Topics covered include research question formulation, cross tabulations, controlled comparisons, hypothesis testing and bivariate regression analysis. In addition, students will learn to use R, a powerful software program that is popular among political consulting firms, think tanks and government agencies. Government Analytics core course. The course is at the introductory level; there is no prerequisite.

470.683 Scandal Management, Ethics, and Public Policy
This course explores the role of ethical values and reasoning in scandal management and public policy from the standpoint of elected officials, nonprofit leaders and "you" the public manager. Theoretical perspectives are applied to practical cases concerning privacy, safety, race and affirmative action, pornography and cybersecurity, downsizing in the public sector, and leadership, among other topics. Historical and contemporary cases are discussed. Special attention is given to communication issues, public relations, and the language of ethics.

470.684 Legislative Language and Policymaking
This course examines the process of drafting legislation and the consequences of legislative language in the implementation and adjudication of federal policies. Focusing on the various stages of the legislative process, this course considers the expert and political sources of the legislative language in the U.S. Congress and the importance of language in coalition-building for policy passage. Examining the interactions of Congress with the other branches of government, the course also considers how presidents, the executive branch, and the judiciary interpret statutory language.

470.686 Contemporary Congressional Politics
What are the political forces that shape the contemporary Congress and how does Congress, in turn, re-shape American politics? This course considers how political, social, and technological changes outside the institution help to explain contemporary congressional politics. Topics include: Congress’s role in the separation of powers; its responsiveness to interest groups, ideology, and partisanship; competitiveness in congressional elections and constituency representation; and contemporary media politics.

470.687 The Political and Social Media Revolutions
Extraordinary innovations in personal communications technology are remaking American political life. Social media are now broadly popular across all social boundaries. Collapsing business models are restructuring media of all sorts. And the fast growing power and reach of targeting are revolutionizing elections. In some ways these changes hark back to pre-Gutenberg eras when virtually all communication was social. In other ways they repeat a classically American story in which each successive wave of popular enfranchisement was helped along by something new and more powerful in the ways a continental people kept up with the news -- and stayed in touch with one another. But in enabling individuals to interrelate locally and globally simultaneously and in real time, they are without precedent. Examining these changes from each of these perspectives will be the subject of this course. This course counts towards the Concentration in Political Communications.

470.688 Political Institutions and the Policy Process
Bridging the divide between political science theories of policymaking and the actual workings of the policy process in the institutions of national government, this course examines the individual contributions of each of the legislative, executive, and judicial branches of government as well as the interactions and struggles between those branches. How do these various institutions set the policy agenda, develop and deliberate policy alternatives, make authoritative policy decisions, and implement those decisions? In what ways are the interactions between these institutions best considered conflict or cooperation? Also, how do outside actors and institutions -- the media, interest groups, public opinion, parties and campaigns -- affect policymaking in these various institutional settings? Drawing on the Constitutional design and historical development of these institutions as well as contemporary practice, this course examines the purposes, processes, and outcomes of policymaking from an institutional perspective.

470.689 Growing Apart? America & Europe in the 21st Century
The tension between the United States and Europe over the war in Iraq, as well as the casting of an “Old Europe,” a “New Europe,” and a “go-it-alone” America has brought into sharp relief that the two major high income centers of the world economy may be following very different paths of development, politically, economically, and culturally. This course surveys how America and Europe are both similar and different, and how, despite the supposed homogenizing effects of globalization, those differences are actually becoming more, rather than less, pronounced over time. The class will examine how the U.S. and Europe have, sometimes developed along similar lines, and sometimes developed along quite different lines; politically, economically, and culturally. This course traces these developments and surveys what why this historical moment seems to be one of “growing apart” and what still holds them together despite such differences.

470.690 Political Campaigns and the Media
The purpose of this course is to understand the important interaction of politics and the media during political campaigns. Issues that eventually become policy when a candidate is victorious and wins office, usually were identified during a political campaign to win votes from various constituencies. This course will examine how the candidate decides on particular topics to stress and how the media decides to cover or not cover certain topics in the campaigns. The class will focus on particular foreign policy issues such as the War on Terrorism and the war in Iraq. It will also examine how the candidates, staffs, consultants, and the media handle these topics.
470.691 Digital Citizenship
This course will explore the technological and political implications of digital identity, its relation to various models of national identity and the emerging forms of political participation based, in part, on the increasing important of social software and related tools. We will examine the differences between digital identity and “conventional” identity (an aggregate model instead of a genealogical and geographical based model) and the transition into a digital environment (biometrics, etc.). Special emphasis will be given to the political and cultural factors shaping the conception of identity.

470.692 Military Strategy & National Policy
"War is the extension of politics by other means." This course aims to understand how and why states use force in pursuit of their national interest. This class will study the classical theories of warfare, including Clausewitz and Sun Tzu. Case studies in warfare from the 19th and 20th centuries will be used to develop a model of how states have traditionally used war to accomplish their political aims. In addition, the technological and political shifts of the last decade will be explored to determine what they imply about how states can and will use force in the future as a part of their comprehensive national security policies. (Core course for the MA in Global Security Studies)

470.693 Complex Decisionmaking in National Security
The national security community spends time mostly on routine problems, in organizational structures that are social machines for the processing of routines. Yet the most important national security decisions are not routine. They are complex, and strain our bureaucratic structures optimized for linear processes. The result can be disastrous surprise. In response, this course focuses on the connections among organization, process, action and idea in complex decisions. The course critically examines major complex cases such as Pearl Harbor, 9/11, and the Christmas tsunami, as well as those that students suggest. We will ask if the problems are too complex for existing structures, and therefore, what to do. This course seeks to make us more insightful, imaginative and effective, aware of bias, and open to evidence, especially about the interests of other actors such as enemies. In making their own decisions on complex problems, students will learn, when time is short, how to roughly analyze a problem and how to present it on paper, in formal briefing, and "on our feet."

470.694 White Collar Crime
This course explores the internal workings of the individuals, corporations, and government agencies that abuse their fiscal responsibilities and societal privileges. The definition(s) of white-collar crime, other issues such as victimization, enforcement, and the sanctioning of organizations and individuals will be addressed. Students will examine and discuss important issues concerning punishment for those that commit white-collar crime and the debate between corruption and accepted business activity.

470.695 Proseminar: Essentials of Public and Private Management
(Core course for the MA/MBA program in Government and the MA in Public Management) The purpose of the course is to help equip students to operate effectively in both the public and private sectors. The class will cover three major topics: (i) an overview of managing public and private organizations, with special attention to their differing missions, capabilities, and environments, (ii) a survey of important relationships between the public and private sectors, and (iii) the need for improved coordination between the public and private sectors to achieve important public purposes. Students will be encouraged to make the course an interactive one and to share their personal knowledge in the context of the issues discussed. Students will be expected to complete a significant paper on a relevant topic approved by the instructor.

470.696 Ethics and Privacy in Intelligence Operations
This course will address the ethical dilemmas and privacy issues that challenge intelligence and government decision makers in an increasingly complex operational and technological environment. We will examine basic moral, ethical and privacy considerations from all sides at several key points in intelligence operations from collection to covert action. The course will analyze the evolving nature of privacy concerns worldwide, with an emphasis on the balance between individual rights and national security needs as executed by intelligence agencies. Students will examine the policy implications inherent in seeking to address these issues. The readings will include diverse and opposing viewpoints as well as practicums and simulations to allow debate of the key positions in “real world” situations. Prior enrollment in 406.665 “The Art and Practice of Intelligence” or 470.711 “Intelligence: From Secrets to Policy” is strongly encouraged.

A470.697 Intelligence and Counterterrorism
Counterterrorism is essentially an intelligence war. By definition, both sides use small forces and clandestine means, hiding their presence and activities not only from each other, but often from friends and allies as well. This course will explore the many roles of intelligence in every facet of counterterrorism, and ask students to evaluate their practical, legal, and moral effects and implications. It will also look at the terrorists' own intelligence activities, and the “intelligence race” between terrorists and counterterrorists. There are no pre-requisites for this course. However, students would be well served to have a basic familiarity with intelligence and terrorism before the class starts.

470.698 American Exceptionalism
This course will seek to give students a deeper understanding of where the idea of American exceptionalism comes from and what its implications are for America, both domestically and abroad. Students will gain this understanding from reading classic works in the area that trace America’s political development, starting with its Puritan heritage. Early American works will be studied from this period, along with Alexis de Tocqueville’s Democracy in America. Seminal works of modern political science scholarship on this question will also be assigned, including works from Seymour Martin Lipset, Louis Hartz, Daniel Boorstin, and others. The course will then extrapolate from these historic roots to contemporary issues of America’s foreign policy and rationale for its foreign interventions. The course will conclude with questions of America’s standing in the world, which has in recent years, declined and seek to understand why this is so and what it means for the future understanding of American exceptionalism.
470.699 Washington D.C. - The Seen and Unseen
This course will cover the traditional history of Washington – the city as symbol and capital. Its founding, the federal and monumental core, the several wartime expansions, and its evolution into a world center will be explored. Additionally, the course will focus on the unusual qualities of the living cities such as the curious relationship between its citizens and the government over time, as a crucible of social struggles reflecting the realities of the nation. Through readings, guest speakers, and field trips, from Pierre L’Enfant to Marion Barry and beyond, the course will take a broad look at the history, politics, and culture of this unique entity. There is no Wednesday symposium requirement for this class.

470.701 Politics, Party and Procedure
Congress is a dynamic institution designed to be both a policy incubator and the recipient of outside policy ideas. While modern political parties were foreign to the founding fathers, grouping individuals together for the purpose of government was not. This class explores the creation, execution, and outcome of congressional political parties, though the lens of congressional procedure and the changing dynamic of power between the congressional leadership, committees, and rank-and-file members.

470.702 Introduction to Law and Legal Methodology
This course is taught by a sitting federal trial judge and introduces students to the fundamentals of legal analysis. Students will interpret the Constitution, statutes and case law. The course will cover how the federal court system works and will read and dissect several Supreme Court, circuit and trial court decisions. Students will learn how to “brief” a case to extract its essence and will understand what the holding and the principles articulated by the court are as well as the procedural posture of the case. The objective of the course is to train students in the fundamentals of how to approach the study of law.

470.703 Cyberforce Superiority: Foundational Elements
This course provides students a baseline understanding of cyber programming, networking, and computer network operations. Students will also receive a solid foundation in the historical, legal, ethical and policy aspects of computer network operations and their relevance to today’s events and priorities. The course then reviews the functioning of computers, after which the students receive hands-on education in programming concepts, Windows and Linux tools, Boolean logic and computer math principles that lay the groundwork for a tactile understanding of cyber concepts and skills. Students are not expected to have specialized computer skills.

470.704 Strategies in Insurgent and Asymmetric Warfare
This class examines the phenomenon of irregular warfare—of insurgencies and counter-insurgencies in particular—through a historical lens. The course will give you insight into the origins, objectives, strategies and tactics of irregular wars, as well as the principles of counterinsurgency theory and practice. Through the course you will analyze current irregular wars, understand what caused them and whether they are likely to be successful or unsuccessful, and see how they can be combated.

470.705 The Majesty of the Law: Judicial Process in America
This course considers the philosophical underpinnings of the judiciary, including its origins in Article III of the U.S. Constitution and its reliance on foundational principles of the rule of law and the independence of the judiciary. The class will examine the placement of the judiciary within the American policy, focusing heavily on the concepts of separation of powers and federalism. In this context, we will consider the relationships between the U.S. courts and the other branches of government, as well as the various levels of court jurisdiction from the local county court to the U.S. Supreme Court. The class will analyze the modern judiciary, including its size, scope, jurisdiction, and functioning; and discuss Hamilton's notion that this is the “least dangerous” branch of government possessing neither the “sword nor the purse.” Indeed, the budgetary challenges confronting the modern judiciary will be examined as well as various enforcement issues. Finally, the future of the judiciary will be assessed and the effect that technology is already having on this important branch of government will also be addressed.

470.706 Federalism: The Interplay Between States and Capitol Hill
State governments are the laboratories of policy innovation and in turn often fuel action at the federal level. There are many meaningful lessons from successes in state government policymaking that could be informative to policymakers on Capitol Hill. What is the nature of the relationship between legislators on the federal level and legislators on the state level? What are the incentives or disincentives for Members of Congress to interact with state legislators or vice versa? This course will address the general principles of federalism, then interplay between Congress and the state legislatures and the role that state legislatures play in shaping and driving policy discussions on Capitol Hill. The class will provide an in-depth analysis of specific policy issues that are currently debated on both Capitol Hill and the state legislatures in order to facilitate a comparison and critical examination of the public policy debate at the federal and state levels. A visit to the Maryland General Assembly for a visit with the Governor and legislative leaders is planned.

470.707 Asian Politics: Challenges and Opportunities
As the 20th century came to a close, many scholars and commentators predicted that the new century would become the Asian century. The prediction was based on economic expansion, political maturization and population growth in Asia that walked in step with a perceived decline in the West, particularly Europe. This course will provide a comprehensive examination of the issues involved in Asia’s emerging prominence in the world. Central to the study will be consideration of the institutional, cultural and political obstacles that stand in the way of regional progress. These issues include concrete problems such as ingrained poverty and corruption as well as intangible subjects such as the difficulty of creating independent, functioning governing institutions after centuries of colonialism. Security threats posed by Islamic fundamentalism and military imbalance of power are of increasing importance. Asia’s challenges and opportunities carry major implications for the United States, the preeminent power
in the Pacific. It is thus necessary to define U.S. interests and examine various policy directions regarding Asia. By the end of the semester, students will understand where Asia stands today, how it got there, where it is going, and what all of this means for America.

470.708 Unleashing Open Data with Python
Learning the basics of the computing language, Python, empowers people to retrieve and analyze data in new ways. During the course, students with no prior coding experience will learn how to gather and analyze data in ways that are not possible without the assistance of programming. After covering the fundamentals of syntax and logical thinking, students learn how to read, create and edit files. Then, building on that knowledge, students interact with online resources through web scraping and APIs. Finally, students will use the data they collected to create their own analysis and publish their research to a website. The class equips students to add programming components to their future work, giving them an advantage in a competitive workplace.

470.709 Quantitative Methods
(Formerly Introduction to Quantitative Research Methods. Core course for MA in Public Management and may be taken in place of 470.852 Research and Thesis II with permission from the instructor. Core course for Government Analytics.) Students will learn how to construct and evaluate multivariate regression models, which are useful for answering causal questions about issues related to political behavior, policy and governance. Topics include multivariate regression, interaction terms, measures of fit, internal and external validity and logistic and probit regression. The focus of the course is on using statistical methods in an applied manner. The course will also introduce students to Stata, a widely-used statistical software program. Recommended prerequisite: Political Analysis and Statistics.

470.710 Advanced Quantitative Methods
Extends to the concepts taught in Quantitative Methods. Provides students with the tools needed to construct and evaluate advanced regression models. Topics include logs and polynomials, instrumental variables, fixed effects, time series and forecasting models, dynamic causal effect models and regression discontinuity models. Government Analytics core course. Prerequisite: 470.709 Quantitative Methods.

470.711 Intelligence: From Secrets to Policy
This course examines the role that intelligence plays in the formation of national security policy. The course explores the forces and events that have shaped U.S. intelligence. It examines the steps involved in producing intelligence from requirements through collection, analysis and the actual making of policy. The role of intelligence in the major intelligence issues facing the United States today will be discussed as well. The main text for the course will be Dr. Lowenthal’s book of the same title published by CQ Press which has been called the “best introduction to the role of the U.S. intelligence community in the national security policy-making process.” This course counts toward the Homeland Security Concentration.

470.712 The American Civil Trial
This course, taught by a sitting federal trial judge, will introduce students to the trial as a critical element of the American legal system. Using a civil trial as a model, students will explore the procedures leading up to trial – motions practice and discovery – and the format of the trial itself, from opening statements to evidentiary issues, direct and cross examination, expert testimony and closing argument. Students will read excerpts from actual trial and pretrial proceedings and summaries of some noteworthy American trials. The course will give students a practical understanding and a unique perspective of the workings of the American legal system.

470.714 Policymaking in the U.S. and Latin America: Perceptions and Misconceptions
Formerly taught part in Mexico, this summer it will be taught solely in DC with new course material. The course will introduce students to major political trends in Latin America and the state of U.S. relationships with countries in the region with a focus on US-Latin American relations (highlighting Mexico, Argentina, Bolivia, Brazil, Chile, and Guatemala). The course will cover both the history of the countries and the U.S. relationship with each.

470.715 Political Conventions: History and Relevance
Our timely course will be taking place as the Democrats get ready to meet in Denver in August, and the Republicans plan on meeting in Minneapolis the first week of September. The course will look at the presidential candidates, possible vice-presidential candidates, the platform and the major domestic and foreign policy issues that will be important in the general election in the fall. The course will also look at the role of the delegates, the campaigns and the media at the conventions. Other topics of discussion will include how conventions help the national political parties survive and re-charge themselves as viable institutions. We will examine how delegates are chosen, what their roles are at the conventions, and what role the super-delegates will play. An important point of examination is whether party platforms and the goals of the presidential nominees agree and why often the nominee goes his own way without regard to the party position on the issues. With the good chance that the Democratic Convention will still be up in the air between Senators Obama and Clinton, we will also study and analyze what a brokered convention might look like.

470.716 Road to the White House: The General Election
This course examines all aspects of the presidential contest including looking at the role and views of the candidates on the leading domestic and foreign policy issues of the campaign. The class will analyze the role of the media, the impact of the internet, and the financial requirements of the campaign. The course will assess the pivotal role of the campaign managers and consultants and key outside advisors from the worlds of politics, business and entertainment. A key ingredient of the class will be the SAIS Center on Politics & Foreign Relations, the Financial Times and JHU Graduate School of Government breakfasts in the fall that students will be able to attend. The class will also watch and analyze the presidential debates. On election night, the class will hold a reception looking at the returns. After the new president is elected, the class will focus on how the country’s new Chief Executive puts together his new Cabinet and team of advisors.
470.717  Risk, Politics, and Public Policy
The future is an unknown land for individuals and for governments. It poses opportunities for gains and possibilities of losses. The risks of losses include terrorist acts, wars, natural catastrophes, poor health and many other misfortunes. Individuals, including public officials, perceive risks in different ways, and this class will look at classical, behavioral, and cultural theories of risk perception. Governments assess and manage collective risks, often with regard to politics and the concerns of voters. This course will analyze and evaluate such collective responses to risk. The course will be of use to students interested in homeland security, foreign affairs, environmental policy, health care, social security, and financial market regulation.

470.718  Dissidents in American Foreign Policy
In the 1970s, Washington intervened twice to save the life of opposition leader Kim Dae-jung who went on to be elected president after a democratic transition in South Korea. Support for refuseniks and other dissidents were central to American policy toward the Soviet Union and other communist regimes. After the Cold War, a common assumption took hold that the great ideological battles were over. However, in a short period of time, the US has been challenged by new threats of Islamist extremism, invigorated authoritarian regimes, and a backlash against the Bush administration’s “democracy agenda.” These developments are an occasion to consider the role support for individuals has played in the past and should play in the future. Has the U.S. been opportunistic or principled in its support for dissidents? How does support for dissidents and human rights activists relate to American ideals in foreign policy? This course will consider not only the role of dissidents in American foreign policy, but also the ways dissent under repressive regimes has changed.

470.720  Science and Government
Science forms the heart of many of our most contentious national issues, from climate change to stem cell research, from teaching evolution to exploring space. Americans view science with both suspicion and awe. We support science watchdog organizations, while we also support increased spending on scientific and medical research. We worry that science opens Pandora’s box, yet we look to scientists and engineers to provide solutions in fields such as medicine and alternative energy. This course examines this national paradox, by exploring the interrelations among government, the scientific community, and concerned citizens. Because of its role as both patron and regulator, the federal government is the chief actor in these science dramas. Through lectures, readings, and discussion, the course will look at government research agencies such as the NIH and NASA, at federally sponsored research in universities and companies, at major science initiatives such as the Human Genome Project and the National Nanotechnology Initiative, and at oversight organizations both within government and without. The course will pursue the questions of why and how the government supports so much science, and what role science & engineering play in the nation’s social and political aspirations.

470.721  Comparative Federalism: The United States and the European Union
Federalism – the division of power and sovereignty between a central authority and local governments – has emerged as one of the most important themes of contemporary Western politics in both the United States and Europe. For the United States the division of power between the Federal and State governments lies at the very heart of the American Constitution. At the same time disputes over the precise balance of Federal and State power has been a major fault line in American politics since Federalists and anti-Federalists at the time of the founding. For Europe the destruction of two World Wars showed the destructive side of nationalism and acted as an impetus to leverage Europe’s common history and cultural inheritance to forge a supranational political and economic union dedicated to peace and prosperity. Since the end of the Cold War and the Treaty of Maastricht the process of European integration has speeded up rapidly resulting in a common European currency as well as common legal and political institutions. At the same time concerns about the perceived loss of sovereignty, national identity, and democratic accountability have led in some places to backlashes against Brussels and resurgent nationalism. There is also the broader question of the European Union’s goals and identity – is it principally an economic union or is it a super-state in the making? In this course we will explore Federalism in its institutional, legal, philosophical, and historical aspects in both America and Europe.

470.722  Intelligence, War and Political Conflict
Intelligence exists as a function in order to provide a competitive advantage. This class will consider the intelligence requirements inherent in various forms of struggle, both violent and otherwise, and to consider how intelligence organizations have adapted to meet those requirements. Using primarily an historical approach, the class will consider a range of military conflicts, as well as domestic political struggles and intelligence for peacekeeping and humanitarian purposes.

470.723  Western Political and Constitutional Thought
This is intended as a broad survey of Western political thought, particularly as it developed in the European historical context from the classical era to the 20th century. The thinkers we will discuss can be thought of as engaged in what Robert Hutchins called a “great conversation” across the centuries on the central questions of political philosophy. These questions include: What are the purposes of government? What is the best form of government? How are justice and liberty best realized in a political system? What are rights - and where do they come from? What is sovereignty and in whom does it reside? What principles make political authority legitimate? Is disobedience to political authority ever justified? In many ways these questions are perennial ones, as relevant in our own time as in the distant past. Moreover the divergent systems of thought developed to answer these questions continue to shape much of contemporary political life - e.g. democracy, constitutionalism, liberalism, socialism, and conservatism. Among the political philosophers who will be examined are Plato, Aristotle, Augustine, Thomas Aquinas, Machiavelli, John Locke, Edmund Burke, Thomas Hobbes, Jean Jacques Rousseau, Friedrich Nietzsche, Karl Marx, Hannah Arendt, and Leo Strauss.
470.724  The Politics and Economics of Post-War Reconstruction
This course examines the challenges of peace-building, state-building and development in contemporary post-conflict contexts. From rebuilding the economy and strengthening institutions to overcoming the legacies of violence, donors, diplomats and military forces are confronting the core political struggles of modern statehood. This course will examine current research and practice to explore the elements of post-war economic and political development on the ground, including peacekeeping, security and justice, economic policy, governance, public participation and reconciliation. It will also examine the policymaking processes in donor countries and international organizations that affect the role of foreign aid and intervention. Country case studies will serve to explore the tensions, trade-offs and dilemmas inherent in these contexts.

470.726  Education Policy and Federalism
This course will explore contemporary issues in education policy with a focus on the evolving relationships between federal, state, and local governments in guiding America’s schools. Topics will include the successes and failures of the soon-to-be-reauthorized federal No Child Left Behind Act, debates over the wisdom of national academic standards, the legal environment for public school finance, the growing role of non-governmental organizations like Teach for America and national charter school networks in public education, collective bargaining in education, and the political dynamics of education reform. The course will include group discussions and papers in which students will be required to select and defend specific policy positions in the areas discussed.

470.727  Equality Law
This course will consider how the 14th Amendment and related statutory innovations have promoted equality among citizens. Students will read U.S. Supreme Court opinions that established or modified precedents governing the constitutional meaning and enforcement of equality. Students also will study judicial interpretation and application of public policies designed to complement 14th Amendment guarantees, such as Title VII of the Civil Rights Act of 1964 and Title IX of the Education Amendments of 1972. Through an examination of legal controversies over rights, resources, differentiation, and stratification, students will become familiar with the role of law in mediating citizenship and social relations and will expand their understanding of the interpretive work of the Supreme Court.

470.728  Influence and Impact of Nonprofits
(Core course for the Certificate in Nonprofit Management) The goal is to convey the history, size and impact of the nonprofit and philanthropic sector in the United States and to offer a comparative, global perspective. In the United States, nonprofit initiative grew out of our earliest colonial history, along with the ideals and habits of self-government. The flourishing of nonprofit initiative is intertwined with our country’s legal and tax systems, the needs of the nation in wartime, interest groups addressing social and economic inequities, the federal role in social service delivery and foreign aid, rising wealth, and perceived threats to internal security. Throughout the course, there will be a comparative perspective that looks at the scope and status of nongovernmental organizations in other countries and the influences on those organizations by their own governments, foreign aid and international philanthropy.

470.729  The Presidency and Congress
This course examines the dynamics of the separation of powers, focusing on the two elected branches. We will study the tensions and conspiracies between and within those branches and look at competing notions of leadership, partisanship, representation, and constitutional government by focusing on the institutions, the revolutions within them, the crises that have defined them, and the character of the men and women who have shaped them. This course counts toward the concentration in Legal Studies.

470.730  Intellectual Property Law
This course, taught by a sitting federal judge, will survey intellectual property law, including patent, copyright, and trademark law. The course will cover the basics of intellectual property and will be taught like a law school class using the case method. The course will also introduce students to the fundamentals of legal analysis. There will be no exam; students will be required to write a paper.

470.732  Communications and Congress
This course will examine how Congress communicates with the American people through the eyes of a press guy. It will teach students how to construct a sound bite just as it teaches the history of Congressional relations with the Fourth Estate. How do you go about writing a press release, talking to a reporter, driving a message and navigating the confusing world of Capitol Hill? What's it like being a Press Secretary for a Member of Congress? In addition to these contemporary applied skills, an historical approach will be taken in considering the evolution of Congress as an institution. Contemporary examples, where appropriate, will be used to underscore points made in the texts. This counts towards the Political Communications concentration.

470.734  Energy, Vulnerability, and War
The course will examine the connection between energy usage and war, especially in light of global warming and the expanding use of fossil fuels. Climate destabilization is already causing melting of glaciers that could radically disrupt water supplies of many great rivers. Furthermore, some experts assert that each degree of temperature increase is associated with a 10 percent decrease in agricultural production. The rapid growth in conversion of agricultural land into plantations to produce transportation biofuels from palm oil, sugar cane, and corn is affecting food supply. The course will examine the potential of these changes to undermine the ability of some nations to govern. It will also provide an overview of some of the literature on the connections between ecological degradation in past centuries and famines, civil wars, and the collapse of civilizations. A review will be made of changes in the world since the 1980 publication of a report entitled Energy, Vulnerability and War that examined the connection between centralized energy systems and their vulnerability to natural disasters, terrorism, and war. The course will look to the future of decentralized wind and solar systems and contrast such renewable energy options with the energy systems that have fueled the global economy over the last century. This course counts towards the Concentration in Security Studies.
470.735 Politics and the New Journalism
Quickly accelerating changes in the ways we get our news are compelling newsmakers and journalists alike to rethink their craft, and their relationships with their audiences, with repercussions for policy, politics and public discourse. This course will examine how innovations – like social networking, mobile platforms, behavioral targeting, etc. – are providing journalists and political leaders with new ways to interact with citizens. It will look at how the rapid migration of consumers to the web is leading news organizations of all types to rethink how they organize, pay for and think about themselves. Students in this course will use real time news developments in the nation's capital as a laboratory for observing the evolving ways news sources and reporters and the public interact. Questions to be considered include whether this digitized and networked environment has implications for the pace and character of changes in public policy. The course will invite practitioners in journalism and politics who are dealing with these developments daily to share their sense of where all this is leading. This course counts towards the Political Communication Concentration.

470.736 Principles of Nonprofit Management
(Core course for the Certificate in Nonprofit Management)
Successful nonprofits need to have strong management systems in place in order to assure quality programs for service and impact. The systems include management of finances, human resources (including volunteers), physical plant and equipment, information technology, marketing, performance measures and other aspects of operations. The course will help the student understand the current thinking regarding “best practices” in managing and improving nonprofit organizations and appreciate the interplay of environmental and organizational factors that influence managerial decision-making. Many of the principles we recommend as “best practice” can be applied to nongovernmental organizations in other countries who have to adjust to changing donor interests and requirements or deal with public attitudes toward non-state actors. This is a core requirement for both the MA in Public Management and the Certificate in Nonprofit Management.

470.737 The Media and Presidential Politics
(This course counts towards the Political Communications Concentration.) This class will look at presidential politics during presidential campaigns and how the candidates work with and against the media. All forms of media from print reporting to television to the new applications of the Internet and beyond will be explored and discussed as we pay particular attention to the role the media play in conveying the president's message to the public. The course will follow key events in the Obama administration, such as, for example, the financial meltdown or growing American involvement in Afghanistan and use them as case studies to better understand the interaction among politicians, policymakers, and the media. We will also look back at former presidents and previous presidential campaigns to compare with the current Obama administration and the 2008 presidential campaign. We will analyze how the 2012 presidential campaigns are just beginning and how the media is now covering possible potential rivals to Obama.

470.738 Time Series Models and Forecasting
Examines statistical models used to investigate the performance of variables over time and predict their performance in the future. Topics include: autocorrelation, moving averages and smoothing, exponential smoothing, autoregressions, seasonality, interrupted time series designs. Prerequisite: Quantitative Methods. Option for a Government Analytics core course.

470.739 Emergency Management and Communications
A series of unforeseen and unprecedented emergencies in recent years have posed steep challenges to private businesses, non-profit institutions, and local, state and federal government. Terrorist attacks, pandemics, natural disasters, financial collapse and other crises pose unique challenges to policy makers. Increasingly, people in authority have had to implement plans, make announcements, and order evacuations, often on short notice, and benefit of effective tools. This has caused the public, private, and non-profit sectors to invest more resources on preparation. This course will examine approaches that have been taken with an eye toward minimizing damages and enhancing the security of the greatest number of people. It will examine some that have succeeded and others that have not. On occasion, guests, who have had been on the front lines in emergency situations will appear in class to enhance students’ appreciation of the extent of these potential threats and to share their ideas as to how they might best be handled. Readings will focus on case studies of historical and contemporary emergency situations and how policy makers addressed them.

470.740 Conflict and Security in Cyberspace
Cyber conflict is a new and complicated strategic problem that will engage the international community at many different levels. The cyber environment challenges traditional strategic thinking, and work on an policies and strategies to manage and benefit from cyber conflict is at an early stage. Traditional security concepts will need to be re-examined and adjusted for the cyber environment. This class will look at both the national and international dimensions of cyber conflict in the larger international security context. This course counts towards the Concentration in Security Studies (MA Government).

470.741 Democracy, Elections and US Foreign Policy
Elections have been described as the primary vehicle for launching and reasserting democracy in any country. Few, however, have considered the connection between the two. In this course, students will consider initially the various ways by which democracy has been defined, asking: What is democracy, why is it important and what “values” related to it should be upheld in holding elections? Students will also look at different electoral systems used for organizing elections around the world. Do these systems make a difference to election outcomes? Are there consequences for choosing one over another? Real world examples, including the controversy surrounding the 2000 American presidential election, will be used to consider whether greater attention should be paid to the linkage between democracy and elections. This course counts towards the Concentration in Security Studies (MA Government).


470.742 Models of Public Policy Analysis
This course will introduce students to the methods of analysis that are central to the study of public policymaking. The course is ideal for those who are completing a thesis or capstone that involves policy analysis. Topics covered include punctuated equilibrium, institutional approaches, behavioral approaches, policy diffusion, policy streams, public value mapping and network effects. These methods of analysis allow researchers to better understand policy change. They help answer questions related to how and why certain policies are implemented while others fail to advance through the political system.

470.743 Data Mining and Predictive Analytics
Many government agencies engage in data mining to detect unforeseen patterns and advanced analytics, such as classification techniques, to predict future outcomes. In this course, students will utilize IBM SPSS Modeler to investigate patterns and derive predictions in areas such as fraud, healthcare, fundraising, human resources and others. In addition, students will learn to build segmentation models using clustering techniques in an applied manner. Integration with other statistical tools and visualization options will be discussed. Recommended pre-requisites or co-requisites: Statistics and Policy Analysis, Quantitative Methods.

470.744 Trade and Security
Since the Second World War, American trade policy has been implemented through agreements with a growing array of foreign governments to encourage global economic integration by lowering barriers to international trade. The course will begin with a look at the foundation of this approach to trade policy at the end of the Second World War and the relationship the Roosevelt and Truman administrations saw between integration and security policy. It will then introduce students to the American trade regime of the early 21st century and the WTO, and examine the ways the U.S. governments has adapted this regime to regional challenges arising from relationships with Japan, China and the Muslim world, and to policy issues like resource dependence, sanctions and export controls. The course will have a mid-term exam on America’s trade regime and the concepts that have shaped it, and a final paper in which students will examine an issue of their choice in depth.

470.746 Understanding Contemporary Iran
This course provides an introduction to historical, religious, economic and cultural patterns in Iran. Students will trace the philosophies that gave rise to the Islamic Revolution and analyze the balance between Iranian nationalism and Shi’ism inherent in the Islamic Republic today. The course will cover oil politics, pre- and post-revolutionary foreign relations, as well as organization and operation of the Islamic Republic.

470.748 The Art & Practice of Intelligence
This course will examine how what intelligence is and how it is done. It will place a strong emphasis on effort on the limits of the possible including limits on knowledge, ethical limits, and political limits. Drawing on historical examples, the course will look at the various types of intelligence collection and how they interact with each other. It will explore the analytic process and the interface between analysts and policymakers. It will examine the connections between intelligence and policy formulation and execution in various aspects of the national security realm. The class will conclude with a brief exploration of differing concepts and practices in other countries.

470.749 Changing News Cycles
A news cycle was once measured in the number of hours between each issue of a newspaper. Today the architecture of news cycles is changing even more dramatically. Building on the coverage of the 2008 campaign, real time competition among cable news channels and on line media is creating news cycles of sometimes 15 or 20 minutes. This quickening is often accompanied by the demand for ever more information nearly simultaneous with developments and minute-by-minute evaluations. This compression, along with the demands of permanent campaigning, also creates new ways of talking and thinking about politics. Critics say the hyperactive coverage fosters a corrosive sense of politics that works against governance. This course will look at why the tempo of news stories is accelerating; how the changing structure of media is influencing and being influenced by it; and how the increasing velocity of news is affecting policy, politics and public discourse. Part of the focus of the course will be on newer web outlets, like Politico and HuffPo, along with the trend toward ideologically framed cable news coverage (not just Glenn Beck) and the growing journalistic functioning of social media. Students will explore how news flows between the mainstream media and blogs and vice-versa and use for classroom discussion breaking news coverage to better understand these new patterns. Guest speakers will include journalists and political professionals who will share their insights and experiences adapting to this new dynamic of changing news cycles.

470.751 Politics and Security in the Middle East
This course will cover key topics relating to Middle East politics and security, with a particular emphasis on emerging dynamics of the region in the wake of the Arab Uprisings. The course will explore several key themes such as the rise of sectarianism, evolving trends in Islamist militancy, and the status of social movements and identity politics in the Middle East. It will also address longstanding issues such as the ongoing Israeli-Palestinian conflict and Iran’s role in the region. Finally, the course will also examine U.S. policy responses to the changing political and security landscape of the Middle East. Classes will alternate between broader, theme-related sessions and country-specific cases.

470.752 Intelligence Analysis
Intelligence analysis is fundamentally about understanding and communicating what can be known, not known, and surmised, as it can best be determined, to decision makers. Students will learn the basic skills of the intelligence analysis trade and have the opportunity to practice them through work on a semester-long project with current intelligence and national security applications. Students will also grapple with the complex psychological, political, organizational, ethical, and legal issues surrounding intelligence analysis both now and in the past. Counts toward Security Studies Concentration.
470.753  Problems in State and Local Government: Can They Be Fixed?
State and local budget and tax systems are not optimal — and in many cases not functional — for 21st century governance. This course will look at aspects of budget and revenue systems that could be modernized and improved, and how that might be accomplished. Areas studied will include use of budget projections, tax expenditure policies, sales, income, and property tax issues, and business taxation, as well as issues of whether and/or how use of newer technologies and newer ways of doing business should be taxed. It also will consider some current trends that could further undermine governance, such as proposals to write specific funding formulas into state constitutions. Issues and trends will be considered across states, and students will be assigned specific states to study in depth and discuss during class time. Both policy solutions and the interest groups and political strategies that are necessary to achieve solutions will be discussed. The course will begin with a brief introduction to state and local finance.

470.754  Global Climate Change and U.S. Energy Security
While the world negotiates a new climate change treaty, the U.S. continues to work through its domestic climate change policy. Twenty states have developed state-wide climate planning initiatives and there are regional policy initiatives as well. At the federal level, legislation to address climate policy and energy security are being debated in Congress. In addition, as a follow up to a 2007 Supreme Court ruling, the U.S. Environmental Protection Agency is moving forward with a number of regulatory actions to address greenhouse gas emissions. This course will address each of these international and national efforts and their implications for the further development of climate change and energy security policy in the U.S. The economic and social issues associated with these policies will be examined as well.

470.757  Nonfiction Writing and Politics
Clear and persuasive writing is often essential in Washington and this course will introduce students to three of the most important forms of non-fiction writing: opinion journalism, magazine writing, and personal essay and memoir writing. Students will be required to produce finished work in each of these genres and will read and critique each others’ efforts. They will also be expected to read and bring to class examples of successful nonfiction writing. The section of the course on opinion journalism will analyze editorial and op-ed writing and discuss how to make an argument that is convincing even to those who do not share one’s point of view. The section on magazine writing will focus on the organization and structure of successful magazine pieces such as those appearing in such publications as The New Yorker, Vanity Fair and The Weekly Standard. The section on memoir writing will examine narrative structure and techniques useful to a writer who seeks to tell his own story.

470.758  Data-Driven Campaigns and Elections
This course examines how campaigns increasingly rely on data and analytics to inform their voter mobilization and persuasion strategies. Campaigns are leveraging massive databases that contain information on voters’ spending, political engagement and media-consumption habits. Using this information, campaigns can make smart decisions about which television/print ad slots to purchase and which voters to target in get-out-the-vote efforts.

470.759  American Political Development
This course examines the factors that promote stability and change in American politics. Broad in historical scope, this course considers the development of the American state and its institutions as well as the continuities and complexities of American political culture by analyzing key moments of institution-building and policy change from the American Founding to the present. Key questions include: What explains the character of the American state? What are the consequences of the American state and its policies? Is America “exceptional” in these and other regards? What roles and functions do political institutions perform? What roles do culture, ideas, and rhetoric play in social, political, and economic life? How have these various roles and functions changed over time?

470.760  Comparative Intelligence Systems
Do all countries conduct their intelligence activities in the same way? If not, what are the reasons for the differences? This class will consider theoretical ways of understanding and assessing national intelligence systems. It will look at political, historical, and cultural factors which may influence the development and functions of nations’ intelligence agencies and systems. The class will include an examination of the “ways of intelligence” of the United States, the United Kingdom, the USSR/Russia, Germany, China, and Iraq, among others.

470.761  Ruling the 21st Century: Economic Success, Military Strength, and the Rise and Fall of Powers
In the late 1980s, as US GDP growth slowed, budget deficits remained stubbornly high, and other economies outperformed the United States, it was frequent to hear people argue that “the Cold War is over—and Japan and Germany won.” At least those latter powers were U.S. allies. Since that time, moreover, they have encountered their own challenges—Germany in reintegrating its own eastern half and then helping establish the viability of the EU and Euro systems, Japan in dealing with a protracted deflation of its earlier financial bubble combined with demographic challenges that leave its future economic prospects still quite uncertain. Today, we are witnessing a period of even greater American economic travails, much larger fiscal deficits, and the concern that less friendly powers—China, Russia, perhaps India and others—may be poised to benefit from the relative decline of the United States in specific and the West in general. Is this true? Even more to the point for this course, what do these shifting economic realities bode for the future of American power and ultimately the security of this country and its allies? This course, informed by both historical and technical perspectives, will wrestle with such broad questions about the architecture of the international power system. It will consider the relative decline of the United States that many consider underway to be already, and only likely to accelerate—asking not only if it is indeed a reality, but also what its likely magnitude and scope will be. It will examine the promise of the rising powers, together with the structural constraints and other impediments that they will have to face themselves as they seek greater stature, clout, and prosperity in the 21st century. The course will be informed by readings such as those of Donald
Kagan about the ancient empires of Rome and Greece, Paul Kennedy's Rise and Fall of the Great Powers with its emphasis on the last five centuries, Aaron Friedberg's study of Britain's decline a century ago called The Weary Titan, literature from the above-mentioned 1980s debate in the United States, and more contemporary materials. It will also include readings on China's economic prognosis, on America's technical and scientific fundamentals, and other related matters. The ultimate purpose of the course is to help students assess the emerging power structures of the 21st century and determine how they think the United States as well as other countries can best adapt to—or alter—the tectonic shifts that are underway.

470.762 U.S.- Mexico Relations: Migration, Trade, and Organized Crime
The "immigration issue" with Mexico is being hotly debated as America continues to struggle with immigration policy reform in the post-9/11 era. Other important policy areas of mutual interest to Mexico and America as neighbors are trade, security, environmental and energy issues. This course will explore and compare the government and politics of each country and important cultural differences impacting their governing styles and attempts at cooperation to address critical policy areas. The course will include at least 6 videoconference sessions with faculty and students at CIDE University in Mexico City. There will also be one videoconference session connecting the class with both CIDE and Fudan University (Shanghai, China) to discuss trade and global governance issues which are of interest to all three nations.

470.765 Mass Media and American Politics
While the mass media is not formally part of our government, it exerts a powerful influence upon it, by shaping public attitudes, by helping citizens learn about the world, and by allowing public officials to communicate with citizens and with each other. This is an exciting time to be learning about the political role of the mass media. The rise of the Internet, the growth of 24-hour cable news and the decline of the “Big Three” television networks has created a much more fluid and stimulating media environment than existed just a decade or two ago. But this course is not simply about the role played by the mass media in a political system. It will also cover how political actors inside and outside of government try to shape media outputs and how they try to use the press to accomplish their own goals. We will also look at how blogging and YouTube have blurred the lines between journalism and activism, and have enabled ordinary citizens to play increased roles in the civic dialogue. The primary purpose of this course is to analyze the role of the media in American politics and its relationship with the public, business, government, and candidates for office in a democratic society. We will do this by first examining the role and structure of the news media as a political and economic institution, and how it is being transformed by the Internet. We also will examine the conventions and controversies associated with the journalism profession, including news reporting and the news gathering process, questions of bias and objectivity, and investigative journalism.

470.766 Economic Growth: The Politics of Development in Asia, Africa and Beyond
What makes some countries grow while others do not? What accounts for successful economic development versus stagnation? As these questions become ever more relevant in an increasingly globalized world, this course offers an introduction to the topic. The class will provide an overview of the main classic and current theories of economic development. It will then go on to explore specific current issues in development, including: development aid, role of international organizations, sustainable development, corruption, institution building and regime type. Specific case studies will be examined including China and India, the East Asian ‘tigers’, development failures in Africa and mixed outcomes in Latin America.

470.767 The 2014 Elections: Midterms, Media, and Message
The class will analyze and discuss topics both domestic and foreign that will dominate the mid-term race. The class will look at the candidates’ running and their messages being sent out through social media. How are the candidates framing their messages to the voters in 2014? Will the Republicans gain control of the United States Senate? Will the Democrats gain more governors? Will more Tea Party candidates win in House of Representatives? Will the 2014 mid-term elections be a harbinger of things to come in the presidential races of 2016? The class will also focus on how the media covers from Twitter to The New York Times to MSNBC and Fox covers the elections. We will not only look at how the media covers the issues but how all the various media cover fundraising, staffers, organization and consultants. The class will also discuss how the possible 2016 presidential candidates from Hillary Clinton to Rand Paul are taking part in helping get their colleagues elected in 2014. The course will focus on the Super PACs and the role of money from all sides from George Soros on the left to the Koch brothers on the right. This will be a lively class with students taking part in political discussions and students acting as candidates and the media for their main papers.

470.768 Nation Building as Security Policy
Nation building is nothing new, but it has recently become a prominent way to achieve U.S. national security. Nation building has a long history, including imperial attempts, the anti-colonial attempts that followed, and the creation of new states. The United States also has a history of nation building in Central America and the Caribbean, following the Second World War, and in Vietnam. The history of nation building is reviewed systematically for lessons learned. Particular attention is paid to recent efforts in Iraq and Afghanistan. Attention is paid to specific policy statements and organizational capacities for nation building. The course concludes by examining nation building as a way in the ends, ways, and means linkage of national security strategy. Students are expected to leave the course with an understanding of the challenges of nation building as a way to achieve U.S. national security and the ability to enter into an informed debate on the role that nation building plays in U.S. national security strategy.

470.769 Data Science for Public Policy
In practice, data offices are no longer in the basement with the servers and the boiler room; they’re on the top floor next to the executive staff. The modern policy analyst needs a strong understanding of how to use data and how data can inform strong decision making. To this end, the course has two goals: 1) arm students with a high level understanding of how federal and state agencies are using and should use data; and 2) provide a strong foundation of cutting-edge data science skills.
470.770 Transatlantic Learning: Lessons from European Energy & Environmental Policy
This course offers a new perspective about environmental, climate, energy and urban development policies and cooperation with Europe and reviews and analyzes these policies, their development, their performance and assesses their potential applications to the U.S. Urban themes are the focus of this class, given the leadership and progress of many European cities, particularly in the areas of renewable energy, energy efficiency, transportation, "green" buildings, water infrastructure, and brownfields redevelopment. For example, we will study, among other themes and projects, energy efficient housing and buildings policies in Freiburg, brownfields redevelopment in the Ruhr Valley, green infrastructure practices in Stuttgart and renewable energy policies in Copenhagen and their potential transfer to the U.S. We will then explore issues about how energy strategies of Stuttgart can be integrated into energy planning in Northern Virginia, how stormwater management practices in Berlin can be applied to Washington, D.C., and how light rail systems in Freiburg can be adopted in Baltimore. At the end of this course, students will be aware of the key European environmental and energy policies supporting these innovations and will appreciate how U.S. cities can learn from them.

470.771 Climate Change Economics
This course will examine the key issues, concepts and applications of economic analysis to climate change mitigation and adaptation policy development and implementation at the sub national and national levels. It will include concepts, techniques and case histories of microeconomic, macroeconomic, and distributional impact analysis as applied to specific sector based policies and measures and related policy instruments, as well as broader approaches for assessment and management of economic security. Emphasis will be on comprehensive understanding and skill development as applied to real world policy and business applications, including current economic, energy and environmental issues and assessments. Students do not need advanced economic, science, policy, or quantitative training for the course, but should have basic exposure to concepts and skills in these areas to support learning experiences and skill development.

470.772 Islam and Politics in the Middle East
The Islamic Republic of Iran has become an increasingly important player on the international stage and remains a challenging issue for US policy-makers. This course examines Iran's rise as a regional power in the Middle East from the 1979 revolution through the contemporary period. It will explore four major topics: 1) the role of Islam and Islamist ideologies in the Iranian state; 2) Iranian political dynamics; 3) the Revolutionary Guards and their influence on Iranian policies; 4) Iran's foreign involvement, particularly in Lebanon and Iraq. Through readings, lectures, and class discussions this course will address several important questions: To what extent do Islamist ideologies impact Iranian policies and decision-making? What are the major issues driving current Iranian politics? What factors have led to the Revolutionary Guards ascendancy and what are the prospects of a military takeover of the regime? What are the roots and limits of Iran's foreign involvement and how do organizations like Lebanon's Hizballah support Iran's interests abroad? Is Iran a rational or ideological international actor? By the end of the course, students will be able to effectively address these questions and have a firm understanding of the key events, ideas, and issues impacting contemporary affairs in Iran and the broader Middle East.

470.773 Energy and Environmental Security
This course surveys the multiple and overlapping aspects of energy and environmental security. Students analyze the contentious proposition that increased competition for environmental and energy resources threaten national security and may be the source of future wars across the globe. The course also examines how such threats may be mitigated. (Core course for the MA in Global Security Studies)

470.774 Nonprofit Governance & Executive Leadership
This course covers the basic responsibilities of nonprofit boards according to law and custom and includes ethical concepts, public attitudes, and contemporary legislative and regulatory issues. The course explores theories of effective governance and executive leadership that have had wide influence, and how ethical considerations relate to perceptions of excellence and shape the way staff and volunteer leaders manage people and money. There will be opportunities to compare the role of boards in US nonprofit groups with those in other countries, with a special emphasis on countries whose legal systems provide for significant state control of nongovernmental initiatives. Core course for the Certificate in Nonprofit Management.

470.775 Women and Gender in Law and Policy
This course will examine policy issues and controversies affecting women based on gender. While gender will be the primary category of analysis, it is not a unitary category. Statutes and affiliations based on race, class, sexuality, age -- and other characteristics -- intersect with gender and diversify women's gender experiences. Accordingly, the course will explore policy assumptions and imperatives that address or reflect differences among women, and will consider how policies can affect differently-situated women differently. Readings and discussions will focus primarily on policy issues that bear directly on women's equality: women's constitutional status; employment and the workplace; educational equity; poverty and economic insecurity; reproductive and family rights; intimate violence and sexual coercion. As we examine policies in these areas, we also will consider when and whether women have played a role in policy developments affecting women.

470.776 Nationalism in the Democratic Age
Nationalism and democracy have been two of the most significant forces shaping the contemporary world. The sense of nationality has provided peoples with a strong sense of shared belonging based around the ideas of a common language, land, and heritage. It has sometimes fuelled the demand for collective freedom and democratic self-determination. At the same time it has been a volatile force generating conflicts within and between nations across the globe. In Europe, the effort at forging a common European identity must confront the challenge of resurgent nationalism in traditional countries like Britain, France, and Austria. Meanwhile traditional states like Britain and Spain must themselves confront secessionist nationalism in Scotland, Catalonia, and elsewhere. The modern Middle East has been shaped in part by the conflicting goals
of two major nationalist movements - Arab nationalism and Zionism. In Asia, nationalism is emerging as a dominant theme as countries like China and India rise to political and military power. In spite of economic globalization and the development of international laws and institutions, it is pivotal to understand nationalism if we are to understand world politics today.

**470.777 China and America: An Introduction to Comparative and Global Environmental Governance**

This course will be taught jointly with Chinese faculty and students at Nanjing University in China, by teleconference, web, and live lectures. As the 21st century began, pundits debated whether, like the 20th, it would also be “America’s century,” whether China’s remarkable economic rise would make it “China’s century,” or, perhaps, one seeing the development of “Chimerica.” At the same time, it was also said, that the primary shaper of countries and their fortunes will be the environmental limits to human development—with China (and India), with its huge population and rapid development, and the U.S., with its high per capita consumption, both facing most difficult challenges. This course will study China’s environmental challenges and governance in the context of America’s own environmental challenges and governance system, and in the context of the challenges to the two countries as the primary sources of the world’s greenhouse gas emissions. We will consider how to compare American and Chinese governance systems, and whether and how concepts can be translated between them—so that the countries, and their citizens can learn from, and cooperate with, one another. This course counts towards the Concentration in Security Studies (MA Government). This course also counts towards the Concentration in Energy and Environmental Security (GSS).

**470.778 Federal Contracting Law**

This course is designed to provide students with an understanding of the nuts and bolts of the formation and performance of federal government contracts. Every year the federal government spends approximately $190 billion contracting for supplies, services, construction, research and development. The course, taught by a sitting federal trial judge, will examine the federal procurement process from a legal vantage. Students will gain an understanding of the competitive contract award process as well as issues surrounding performance of government contracts, including socioeconomic policies that affect the award of government contracts such as small business set-asides and incentives to procure from domestic sources. The course will include bid protests and contract disputes.

**470.779 Political and Security Issues in the Middle East**

The Middle East is an important region to examine given its historical significance, the various strategic issues that it raises and, perhaps most relevant for the participants of this course, the challenges that often spill over and become American foreign policy considerations. Building on a historical study of critical junctures in the region, this course aims to provide students with a framework for understanding the state of the region's core political and security issues. In particular, this course will focus on policy-relevant dilemmas surrounding Middle East affairs. After participating in this course, students will be more familiar with the key challenges presented by the Middle East and will have begun to consider the dilemmas that exist in this critical region. By the end of this seminar, participants will be more cognizant of the region's complexity and tensions. They will be able to more capably understand and evaluate U.S. interests in the region, and the ways in which American officials might prioritize policy interventions.

**470.780 21st Century Media: Revolution or Evolution?**

This course will explore historical norms as well as changing theories about the role of the media/press in society, using comparative analysis of different time periods. While media outlets are losing some independence, this is not necessarily the end of the world as the need to increase partnerships—including with non-media entities—is a fact of life in a modern, diversified marketplace. In some cases where newspapers or other news outlets are owned by larger industrial, commercial or even ideological/political interests, the trend actually has an element of returning to the roots of what the press was in the past. The course will use case studies to examine major newspapers that are or were part of larger non-media conglomerates, print publications such as National Review and The New Republic that rely on foundations or major donors for funding, and also networks that need to be part of larger entertainment/online empires to survive. We will also study the phenomenon of the “leaner, meaner” blogosphere and whether it can be a reliable or profitable model.

**470.781 Development of Climate, Energy and Security Plans**

This course will examine the key issues, concepts and techniques associated with the formal development and implementation of consensus-based policy agreements to advance and integrate climate, energy and economic security plans at the sub national, national and international levels. Students will learn the essentials of translating science to policy plans and programs across a wide array of economic sectors, policy instruments and levels of government as applied to culturally, economically, and geographically diverse regions. Issues and techniques will be discussed in relation to legislation, executive and administrative action. Students will focus on theory, advanced techniques, and real world cases in states and provinces, in addition to national and international policy agreements. Students are not required to have advanced backgrounds in economics, science, law, policy or negotiation, but should have basic familiarity with these issue and skill areas to enable learning and performance in a highly integrative environment.

**470.782 The Practice of Public Diplomacy and Statecraft**

This course is designed to help participants gain insights and some mastery over the public dimension of national security policy formulation and implementation. (Much of the knowledge and skills imparted in the course will be applicable to domestic and trans-national affairs as well.) The course will highlight the role of publics and public opinion in the conduct of national security affairs. In addition to practical skills, participants will gain a greater appreciation of the limits as well as the potential strengths of public diplomacy. The course will deal with current international strategic communication challenges, ranging from Afghanistan to transnational environmental and health concerns.
470.783  Presidential Primaries and the Media
The national media play a pivotal role in the early days of presidential campaigns. We will look at the role the media -- e.g., the cable television channels, the newspapers and magazines, the bloggers and the Internet -- play in promoting or demoting presidential candidates as they gear up to run for the Oval Office. The media can literally make or break a presidential candidate in the early stages of his or her campaign. The course will look at how the presidential candidates court the media, in particular, the communications and media operations of campaigns, and how the media court the candidates. We will compare the 2012 presidential campaign with other presidential contests in American history.

470.785  The American Way of War
This course is an overview of US military history and policy with particular emphasis on how the nation has thought about, prepared for, and conducted its wars. As such it examines the interaction of the military, cultural, social, material, institutional, and international factors that have shaped a putative “American way of war.” The course aims to address three key questions: 1. How has the American form of government shaped the way the United States fights its wars? 2. How have those responsible for the actual conduct of war, especially the military profession, thought about war as a phenomenon? 3. Has the intersection of these two questions produced, as Russell Weigley has claimed, a uniquely “American Way of War?” The course will consider how the American conceptualization and practice of war have reflected the intertwined views of political leaders, military intellectuals, and military practitioners. We will start by looking at the way in which the American Revolution engendered the governmental and military institutions of the United States, the “architecture” that has shaped the American way of war ever since. America’s Revolutionary generation understood that war was a fact of international life, and that the survival of the infant republic depended on developing and maintaining the potential to make war. Indeed, the unprecedented ability of the United States to wage war while still preserving liberty is the greatest legacy of the America’s Revolutionary generation. The American Civil War constituted the greatest test of the Founders’ legacy and also constituted the transition to “modern war,” which required the creation of a mass armies and the total mobilization of the nation’s people and resources.” But the United States has always faced the threat of “irregular warfare, from the frontier to the Philippines and the Caribbean. The cases we will examine demonstrate the degree to which those responsible for preparing the United States for war have been successful in balancing requirements across the spectrum of conflict.

470.787  Current Issues in Health Care Reform
This course will provide an introduction to the US health care system, with a focus on current debates in health policy: How much do we spend on health care, and why are costs growing? How are the major public programs structured, and do they need to be fundamentally reformed in order to reduce the federal budget deficit? How will implementation of the Affordable Care Act affect the insurance market? Will it raise or lower costs? What can be done to improve quality of care? We will explore a range of perspectives on these controversial issues, including the views of policymakers, academic researchers, economists, and the role of public opinion.

470.788  National Security and Individual Rights
This course looks broadly at national security and individual rights to deepen our appreciation of the historical and institutional values that protect a constitutional democracy. The framers did not pin their hopes on a single leader to protect the nation, even in times of crisis. They had fought in the Revolutionary War against England to secure their independence and knew the dangers that emergencies bring. They decided, after a close study of history and much debate, that countries are more secure when they separate power and follow a deliberative process of making public policy. Their whole experience revolved against the idea of concentrating power, either in a President or a Supreme Court. What events, particularly after World War II, have caused us to lose sight of those basic understandings? What damage has been done to constitutional government? How can we better respect and protect democratic values?

470.791  Political Writing and Communications
“Get me a press release for the candidate ASAP,” barks your boss, the campaign manager. You take a swig of your favorite caffeinated beverage and look at your screen; what will you write? This course will provide students the skills and tools they need to succeed in this situation and others. In this class, students will learn the art of political writing and communications where practitioners use speed, brevity and pith to ensure that their points are conveyed and understood. The course will give students a foundation on strategy and message development, focusing in particular on communications tools like press releases, media advisories, speeches, memos and tweets. All of the classwork and assignments will be based on political or public affairs issues. At the end of this writing intensive course, students should have the skills they need to work in communications whether it be on a political campaign, on the Hill or at a public affairs agency.

470.792  Understanding, Adapting & Responding to Climate Change
Climate change is one of the most complex, critical, controversial and poorly understood intersections of economic, energy and environmental security in the U.S. and other nations today, with potentially vast implications for domestic and international policy and market decisions. The ability of analysts, investors and policy makers to understand the fundamental underpinnings and relationships of science, economics and policy choices to climate change is essential to future security decisions that are increasing high stakes. This new course in the Center for Advanced Governmental Studies “Understanding, Mitigating and Adapting to Climate Change” is designed to provide comprehensive concepts, factual bases, and choices regarding climate change for students that have not yet been exposed to climate change science or policy. It is designed to prepare them for more advanced, integrative courses and projects at JHU and in the workplace that are multidimensional and innovative. The course will focus on fundamental issues of science and the translation of science to human choices regarding policy action or inaction. It will include current case studies and situations for review and discussion, in addition to systematic review of information in the field.
470.793  The Influence of Public Opinion on Public Policy and American Democracy
Public opinion is an essential consideration for all governments. This is particularly true in a democratic polity. In a democracy, a candidate cannot hope to win office, or keep that office if elected, without understanding the opinions of his or her constituents. Further, citizens are expected to influence the public policy-making process by expressing their opinions to their elected officials. This course will explore public opinion from the perspective of both elected officials and private citizens. We will investigate the origins, structure and influence of public opinion. We will examine recent polls to better understand the methods used to measure, interpret and present public opinion. Finally, we will analyze current opinion in three major policy areas: foreign policy, the economy and social issues. This course counts towards the Concentration in Political Communication. Elective option for Govt. Analytics students.

470.796  News Media and Presidential Nominations
Theodore White wrote, “A primary fight… is America’s most original contribution to the art of democracy.” This course will explore how the news media cover presidential primaries and caucuses, and how that coverage affects the selection of a standard bearer. The course will attempt to put into historical context the 2012 G.O.P. nomination battle, look at how the role of news organizations in covering the fight for delegates is changing along with the media environment and explore the emerging role of social media in deciding nominations. The class will look at the origins of the modern presidential selection process, and how the news media, particularly television, contributed to its emergence. The course will study recent nomination battles, including Clinton v. Obama in 2008 and Bush v. McCain in 2000, as well as pivotal earlier contests including RFK v. Humphrey in 1968, Reagan v. Ford in 1976, and Mondale v. Hart in 1984 among others. The course will look at the role played by polling, televised debates, the early contests in Iowa and New Hampshire and media portrayals of candidate character and positions, as well as the often unintended effects of party rules changes. We will also look at the impact of the “invisible primary” on the party’s eventual choice of a nominee. This course counts towards the Concentration in Political Communication.

470.797  Special Operations in a Strategic Context
Over the last ten years, special operations forces have become a core element in America’s response to trans-national terrorism. These units have trained and advised foreign military and paramilitary forces; captured or killed thousands of Al Qaeda and Taliban commanders and foot soldiers; and conducted a variety of operations around the globe. This course will focus on the ways in which special operations forces have been incorporated into national security strategy and policy. Topics will include how special operations forces are organized, recruited, trained, resourced, and utilized. Through the use of a series of case studies, participants will investigate the differences between special operations forces and other elite units; scrutinize the roles and missions of these organizations; consider the influence of popular culture; and probe the impact of bureaucratic politics and organizational culture between the special operations community and international allies, Congress, the interagency community, and conventional military forces.

470.798  Financial Management and Analysis in Nonprofits
(Core course for the Certificate in Nonprofit Management) The basic tools for financial management and analysis are covered in this course with a focus on those aspects that will: 1) provide needed skills to students planning careers in public and nonprofit organizations and 2) provide those working for government with tools to evaluate nonprofit and private sector organizations with which they interact. Topics include legal and audit requirements for financial reporting, disclosure laws, and state and federal registration requirements. The course will also address interpreting financial statements and assessing and managing for financial health. These basic management tools are necessary not only for basic financial management but also for creating the financial component of a Request For Proposal (RFP) from a US funding source and for those striving for organizational sustainability through “social enterprise” or earned income ventures in general.

470.799  State Politics: A Year in the Life
In this course, each student will be assigned to track a particular state as new legislative sessions begin. During the semester, students will examine the key issues that the legislatures, governors and other branches of state government take up and how social issues, budgets and other challenges are met. Students will explore what makes a state “red” or “blue” and what it means for citizens in those states. Of particular interest are states with governors and other state officials who may have aspirations for the White House and states with new political leaders elected the previous fall.

470.800  Research & Thesis III: Government and GSS
(Core course for the MA in Government) Directed research in an appropriate subject determined in consultation with the student’s adviser is the focus of this final course. Students are expected to propose research topics based on their classwork and/or on material derived from professional experience. Class meetings are designed to give guidance in the clarification of issues, collection of data, assembly of various parts, and the final writing of the thesis. Graduation is subject to approval of the thesis by the thesis committee. Students may enroll in this course only after they have completed all other 11 courses required for the degree; although for financial aid reasons, they may take their last elective along with this course. Research and Thesis III is offered in all three terms—in the summer, fall, and spring—to provide as much scheduling flexibility as possible. Prerequisite: Students must have passed either Research and Thesis II or Research and Thesis II: Global Security Studies or have passed 470.709 Introduction to Quantitative Methods.

470.804  Research & Thesis III: Global Security
(Core course for the MA in Global Security Studies) Directed research in an appropriate subject determined in consultation with the student’s adviser is the focus of this final course. Students are expected to propose research topics based on their classwork and/or on material derived from professional experience. Class meetings are designed to give guidance in the clarification of issues, collection of data, assembly of various parts, and the final writing of the thesis. Graduation is subject to approval of the thesis by the thesis committee. Students may enroll in this course only after they have completed all
other 11 courses required for the degree; although under certain
circumstances, they may take their last elective along with this
course, with the permission of their advisor. 470.804 Research
and Thesis is offered in all three terms—in the summer, fall, and
spring—to provide as much scheduling flexibility as possible.
Prerequisite: Students must have passed either Research
and Thesis II or Research and Thesis II: Global Security
Studies or have passed 470.709 Introduction to Quantitative
Methods.

470.830 Practicum in Government and Politics
One of the great strengths of the Government Program is that
it brings theory and practice together, and recognizes that it
is often from work experience that students gather useful
and practical insights and information that can be applied to
academic work. This course is designed for students who have
an internship or who work in a field that will allow them to use
that work experience to conduct research that may be applied to
their theses. Permission of instructor is required.

470.850 Research & Thesis I
(Core course for the MA in Government) The purpose of this
core course in the Government Program is for students to
refine their thesis topic, develop their research design and
complete a working outline for their thesis. Students will begin
to research and write their thesis during this class in earnest.
The course format is working sessions focused on specific
research-oriented tasks. Emphasis will be placed on completing
the literature review and methodology sections of the thesis.
Students will also complete by semester end a preliminary
chapter of their thesis papers and work with the professor to
develop a plan for the other two papers that will comprise the
portfolio thesis.

470.851 Research & Thesis I: Global Security Studies
(Core course for the MA in Global Security Studies) The
purpose of this course is to introduce you to the research that
international relations and security studies scholars conduct,
and to give you a basic understanding of how to conduct your
own research. With the tools you develop in this class, you will
write a research paper on any topic that contributes to your
thesis portfolio.

470.852 Research and Thesis II
(Core course for the MA in Government and MA in Global
Security Studies. Please note that 470.709 Introduction to
Quantitative Methods may be substituted for this requirement
with permission from the instructor) This directed research
course is designed to help students complete the second paper
of their thesis portfolio (and in some cases if a student has two
papers ready for revision, both their second and third papers).
Students will work closely with the instructor to revise a current
paper, turning it into a research paper that 1) is tightly linked
to the theme of the student's first paper and overall thesis
portfolio; and 2) meets research and writing standards for being
included in the thesis portfolio. Class meetings are designed
to give guidance on the methods of research and on the clarity
and focus of the research question the student is pursuing.
Prerequisite: Students must have passed either Research and
Thesis II or Research and Thesis II: Global Security Studies.

470.853 Research & Thesis II: Global Security Studies
In this course, students will work closely with the instructor to
complete the second paper of the thesis portfolio and to make
substantial headway on the third paper of the portfolio as well.
Students must pass Research and Thesis I before enrolling in
this course. Students may enroll in 470.709 Introduction to
Quantitative Research Methods instead of Research and Thesis
II with the permission of the instructor.

470.860 Capstone for Public Management
"The Capstone for Public Management" is the final required
course in the MA in Public Management program, and students
can only take the capstone course in their final semester and
after having completed all the other core requirements. In the
semester prior to taking the capstone course and conducting the
project, students identify a project topic and adviser. The adviser
may be a faculty member teaching in the program, a supervisor
from the student's place of work, or an expert with appropriate
credentials. To complete the course, students must write a 30 to
35 page capstone paper.

470.861 Capstone for Public Management Continuation
Non-credit; required for those who have completed all of their
course work and have taken the Capstone course, but have not
yet completed their Capstone paper.

470.888 Thesis Continuation
non-credit; required (beginning Summer 2007) for those who
have completed all of their course work including the Research
and Thesis class, but are still working on their thesis. Details of
this offering will be posted soon.
Established in 1962, the MLA Program is recognized nationally for the quality of its teaching and the breadth of its course offerings. The 10-course program enables students to continue their intellectual growth and further their professional goals. The program features small, interactive seminars led by distinguished Johns Hopkins University (JHU) faculty and leading experts from cultural, artistic, government and academic institutions in the region, including The Walters Art Museum, The Peabody Institute, the State Department and the Maryland State Archives. Students study with and learn from other adults of diverse backgrounds, perspectives and interests, and the seminars provide a challenging and nurturing environment. Students can focus on specific areas of learning or explore a wide range of engaging subjects in political science, art history, world religions and philosophy, history, music, literature and science and technology.

A key element of the Center for Liberal Arts, the Master of Liberal Arts Program places inter-disciplinary study at its core, and through this approach fosters greater understanding of the philosophical, historical, scientific and aesthetic dimensions of the world’s great civilizations.

ADMISSION REQUIREMENTS

In addition to the materials and credentials required for all programs, the Master of Liberal Arts requires:

Credentials
A grade point average of at least 3.0 on a 4.0 scale in the latter half of undergraduate studies is expected for degree candidacy; particular interests and work experience are also considered.

Application Documents
- AAP application and fee
- A current résumé
- A 2- to 3-page essay that allows assessment of the applicant’s academic, professional and personal goals
- Official undergraduate and graduate transcripts
- Letters of recommendation are optional

Admission Interview
After application materials have been evaluated, an admissions interview is scheduled with the MLA program director.

Admission Status
Please see descriptions and criteria of the different categories of student status. Applicants who have questions regarding their admissibility should contact the MLA program director.

FELLOWSHIPS AVAILABLE FOR MLA STUDENTS

Limited private, campus-based fellowships are available to cover tuition for individual courses taken by fully admitted MLA students. Application forms are available from the MLA program director.

ADVISORY BOARD

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EX OFFICIO

D. Melissa Hilbish
Program Director

Dianne Scheper
Program Coordinator
COURSE REQUIREMENTS

- **One Interdisciplinary Core (IC)** within the first three courses
- **Eight electives** if the student is doing either the Graduate Project or Internship for the Capstone, or **9 electives** if the students opts to complete the program with the non-credit Portfolio.

The MLA is tailored to students’ needs and priorities. Courses described in this catalog are representative of the broad range of MLA offerings. The same courses are rarely offered two years in a row. For descriptions of the courses listed in Course Schedules that do not appear in this catalog, please contact the MLA program director. For information on exact dates, times, locations, fees and instructors, students should consult the Course Schedule available at advanced.jhu.edu.

UNIVERSITY OF CAMBRIDGE SUMMER COURSE

Since 1992, MLA students have had the option of taking one summer course at the University of Cambridge in England to transfer as an MLA elective. For details about registration, please contact the MLA program director.

CERTIFICATE OF ADVANCED GRADUATE STUDY IN LIBERAL ARTS

The Certificate of Advanced Graduate Study in Liberal Arts is open to students who have earned a Master of Liberal Arts degree from JHU or an equivalent degree from another institution. It consists of 10 courses. Applicants must submit standard application, though JHU MLA graduates need not send any additional materials beyond the application or pay an application fee.

INTERDISCIPLINARY CORES

Recent examples of Interdisciplinary courses have included: “The Self in Question: Readings in Psychology and Literature,” “Monstrosity and Metamorphosis: Imagining Animals in Early Art and Literature,” “Poetry and the Visual Arts,” “The American Southwest: Crossroads of Culture,” and “Science Fiction Film in the 20th Century.”

COURSE DESCRIPTIONS

Core Courses

These courses are representative of the type of core courses required for the program.

450.509 Beneath the Veneer: Film Culture of the 1950s

Pleasantville (1998) provides a look back at the cultural memory we have regarding the 1950s. We will then examine three films which focus on different aspects of the blacklist: High Noon (Screenplay written by the blacklistened Carl Foreman). On the Waterfront (Directed by informer Elia Kazan), and Salt of the Earth (Written, directed and produced by members of the original “Hollywood Ten,”). A study of two musicals, By the Light of the Silver Moon and Gentlemen Prefer Blondes will examine the competing cultural icons of Doris Day and Marilyn Monroe represented within the context of the fifties musical. Other themes explored include the rise of youth culture and concerns over juvenile delinquency (Rebel Without a Cause, The Wild Ones, Blackboard Jungle); war, both cold and hot, with a comparison of The Bridges of Toko Ri (Korean War) to Forbidden Planet’s use of science fiction to comment on the cold war; a focus on film auteur Alfred Hitchcock (Strangers on a Train, Vertigo, and North by Northwest); and a closer look at changes in the western genre (a revisit of High Noon, Johnny Guitar and The Searchers).

450.610 Twice-Told Tales: Classic Texts and their Contemporary Retellings (IC)

This course offers a comparative study of classic texts and their modern or contemporary retellings – in literature and on stage and screen—with a focus on how these ancient stories, which have endured through the ages and helped define our sense of what it means to be human, have been refashioned to reflect modern realities. Examining ‘second stories’ provides the pleasure of seeing the familiar from a fresh and surprising perspective (e.g., the wanderings of Odysses seen through the eyes of his stay-at-home wife, Penelope) and also allows us to study the cultural content of the tales through a bifocal lens. How does the political protest of Sophocles’ Antigone change its thrust when it is retold by a 20th century French existentialist writer during the Nazi occupation of France? Our twice-told pairings are Homer’s Odyssey and Margaret Atwood’s Penelopiad; Sophocles’Antigone and Anouillih’s Antigone; Shakespeare’s The Tempest and Frederick Buechner’s The Storm; Virginia Woolf’s Mrs. Dalloway and Michael Cunningham’s The Hours. Note: This course satisfies the Interdisciplinary Core requirement.

450.621 The Self in Question: Readings in Lit & Psychol

This is an interdisciplinary core. What is the nature of the self? For Plato, the self is a sleeping giant; for Buddha, it is an illusion; for Freud, it is instinctual hunger; for Schopenhauer, irrational will; for B. F. Skinner, it is a machine; for Buckminster Fuller, it is a verb; for Sartre, it is a useless passion. Thinkers throughout the ages have probed the riddle of our human identity, and today, the dimensions of this age-old quest have been expanded to include the formative roles of gender, class, race and culture.

450.636 Cultural Eras: 1950s

This course examines the idea of being “American” within the context of the fifties when “un-American” activities and associations clearly placed individuals and groups on the outside of the mainstream. American national identity is considered through the dynamic that emerges between national
security and civil rights and liberties; between conformity and conflict; between inside and outside. Through the significant and enduring cultural shifts that took place in American life between 1945 and 1960 basic images and ideas closely associated with the '50s are challenged as the course considers a variety of topics from Ike to Elvis to McCarthy, the Beats, the Korean War, the Montgomery bus boycott and the Nation of Islam, The Man in the Gray Flannel Suit, advertising, the Kinsey Report, the promise of technology and the concern over its effects on the culture, the Cold War, the changing role of scientists, and the rise of the suburbs.

450.684  Nature and the American Imagination (IC)
This course offers an interdisciplinary study of the American landscape and the role it has played in shaping American identity. We anchor our study by looking at the way the idea of the land has been constructed throughout our history --- as a kindred spirit by Native Americans, as a "howling wilderness" by the early colonists, as a school for spirit by the New England Transcendentalists, as a precious inheritance in need of preservation by 19th century conservationists such as John Muir and Teddy Roosevelt, and in keeping with Manifest Destiny, as a rich resource that was ours for the taking.

450.704  Poetry and the Visual Arts
This seminar will explore relationships between the languages of poems and those of the visual arts, including painting, drawing, sculpture, and photography. We will begin by discussing theoretical essays contrasting verbal and visual artistic expression, and go on to consider, for example, poems based on paintings (Auden's "des Beaux Arts" and Breughel's "Fall of Icarus"); poetic images that make use of a pictorial tradition (Chinese ink painting in Li-Young Lee's "Persimmons"); reciprocal tensions in the poetry and visual art of a single artist (Derek Wolcott); the use of similar techniques, such as the symbolic coding of color, in poems (Wallace Stevens) and in painting (Marc Chagall); and the individual responses of several poets to the same work. The class will use a blog for the posting of visual images and other class-related materials. Requirements will include short papers/ commentaries, and one long paper.

450.713  Shakespeare & The Film (IC)
This seminar will examine Indian, Chinese, and Japanese film adaptations of four tragedies by Shakespeare. The plays and their directors are as follows: Macbeth (Maqbool by Vishal Bharadwaj, and Throne of Blood by Akira Kurosawa); Othello (Omkara by Vishal Bharadwaj); Hamlet (The Banquet by Feng Xiaogang); and King Lear (Ran by Akira Kurosawa). Students will discuss each play prior to viewing its film adaptation(s); the seminar will also make use of a blog for weekly postings of related materials. Seminar requirements include a paper and oral report concerning the influence of an Asian native tradition on one of the films under study, such as that of Noh theater on Kurosawa's Throne of Blood, or Peking opera on Feng Xiaogang's The Banquet.

450.721  Metamorph Of Violence
This seminar will examine changing concepts of violence in medieval and Renaissance Christianity as manifested in Western traditions of visual and dramatic art. We will first examine Catholic paintings and plays, considering differences between northern European and Mediterranean countries in their depictions of the crucifixion of Christ, the martyrdom and mutilation of the saints, the suffering dead in purgatory, hell, and the Last Judgment, as well as in their approaches to epidemic disease, the corpse, and burial rites. We will then consider the radical changes in these traditions, especially in northern European, in the wake of the Protestant Reformation. Such plays as Titus Andronicus, for example, Shakespeare’s bloodiest tragedy, can be viewed as a newly secular mode for transforming the representation of religious violence in drama. The course will make use of late medieval/early Renaissance visual art from public and private venues (churches, prayer books, illuminated manuscripts, funerary sculpture, anatomical treatises, etc.); of texts from medieval mystery play cycles; of post-Reformation painting and plays.

450.740  Film and Public Memory (IC)
This course fulfills Interdisciplinary Core requirements for the MLA Program. The course is currently being revised. General Description: This course considers the complex interaction between the feature film and culture through a consideration of how films have presented history and science. How accurate are “Historical films” in their construction and presentation? Certainly there are no mediating forces in place to challenge the historical presentation. For the length of the movie the audience exists in a closed world being addressed with a particular set of truths. Studies clearly show that movies do teach and inaccuracies in the movies are more likely to be accepted as truthful even when the presentation is challenged by a scholarly perspective on the subject. This course examines the film as a form of public history; a constructed, mediated version of history often seamless in presentation and powerful in address.

450.749  Exploring the Liberal Arts
What do we mean by the “liberal arts” and why are they more important today than ever before? How do the humanities, social sciences, natural sciences, and arts compare and contrast in terms of their methods of acquiring, analyzing, and conveying knowledge? Are the “ways of knowing” for each discipline incremental or sudden and why or when? The course is taught using a thematic approach. Previous versions of the class have included a focus on “The DaVinci Code,” “Time,” “The American landscape and the American Imagination,” “Interdisciplinary Perspectives on the Fifties,” “Seeing,” “Memory,” and “Nature and the American Imagination.”

450.791  A Cultural History of New York City: World's Fair to World Trade Center
This interdisciplinary course begins with a look at what architect Rem Koolhaas has called “Delirious New York”: the competitive mania of the skyscraper wars, and the rambunctious and over the top worlds of Coney Island, Times Square and Broadway theater in the early 20th century. We then turn to the decisive turning point of the 1930’s when, in the face of the Great Depression, New York City witnessed some of its greatest building projects: the Empire State Building, Rockefeller Center and the monumental projects overseen by NYC’s controversial “Master Builder”, Robert Moses. The New
York World’s Fair of 1933 serves as a fitting symbol for what the Fair itself proclaimed as “The World of Tomorrow”, the world of middle class consumerism, the automobile, the highway and the suburb.

Elective Courses

The following course descriptions are representative of the types of elective courses offered every semester. Please see the website for the actual course schedule for each semester.

450.504  **Halls of Wonder: Art, Science, & Material Culture, 1400-1750**

This course will address the cultural fascination in Europe with sources and objects of wonder and popular imagination. At its core, this exploration will focus on material culture across the academic disciplines (disciplines that were not recognized as separate areas of knowledge at the time) from art, science and technology, literature, religion and beyond. Through our focus, in particular, on collecting material objects, we will also be exploring in great detail the origin of museums, first as private Renaissance and Baroque wunderkammern (German, “halls of wonder”), and then ultimately as the first national museums of the Enlightenment period. Major themes will include: socio-economic change and the emergence of new commercial and professional classes; the rise and consolidation of centralized states; the invention of printing by movable type; literacy and evidence of historical reading practices; patronage of the arts; collectors and the collecting of books and objects d’art; revolutions in the graphic arts; arts and press censorship; the advent and progress of Renaissance humanist interest in the ancient Greco-Roman world; the Protestant and Catholic Reformations; the Scientific Revolution; the production and circulation of literary texts; popular culture (riot, ritual, and rebellion) in the Renaissance.

450.505  **Counter-Reformation: Culture of Roman Catholicism from Late Middle Ages to Early Maryland**

This course will explore one of the most dramatic and revolutionary transformations in the history of the West—the advent of the Protestant Reformation, and the historic shattering of a millennium-old unified Roman Catholic Church, beginning in the late Middle Ages and extending to the period of the early Enlightenment. This course will present students with an inherently interdisciplinary excavation of the many cultural transformations wrought by the so-called Roman Catholic “Counter-Reformation,” including: its impact on religious practice and identity; church-state relations and the “wars of religion;” the religious arts and architecture, particularly in Rome and the Vatican; the relationship between religion and the empirical sciences; cross-confessional conversion and “religious imperialism” in Africa, Asia, and the New World; Catholic print culture and the Renaissance “Printing Revolution;” Renaissance humanism and the rebirth of ancient Greco-Roman paganism in the Catholic world; religious festivals, public spectacles, and popular religious practice; Catholic literature and theater; and other related topics.

450.510  **Leadership and the Classics**

This course explores constants and changes in leadership over time through a selection of readings that ranges from ancient philosophy to 20th-century fiction, including works by Confucius, Plato, Sophocles, Shakespeare, Machiavelli, Hannah Arendt, Martin Luther King, Jr., Anne Tyler, and others. Through directed reading and discussion, students gain valuable insights into how leaders can foster creative initiatives and responses to change. A historical perspective enables students to understand and appreciate the challenge of leadership in the 21st-century multicultural world. They can then develop a framework for interpreting and evaluating responses to that challenge.

450.517  **Music & Literature: Opera in the 20th Century**

The vast and varied repertoire of 20th-century opera offers a rewarding context for the study of the always rich and complex relationship between music and text. In this course, we will study a select group of 20th-century operas and the source texts (plays, short stories, and poems) upon which they are based. We will consider the changes that occur in translating the texts from one genre to the other along with ways in which each opera influences our understanding of the source, and vice versa. As part of this focused study, we will also gain a broader familiarity with the styles of some of the most important composers of the last century. Works to be studied include Pelleas et Melisande (Maeterlinck & Debussy), Wozzeck (Buchner & Berg), Salome (Wilde & Strauss), Peter Grimes (Crabbe & Britten), Death in Venice (Mann & Britten), and The Tempest (Shakespeare & Ades).

450.527  **Literature and the Healing Arts**

This course focuses on the relationship between people, disease, and the practice of medicine. Through a selection of 19th and 20th century literary texts, our readings chronicle the complexities of lives disrupted by illness and offer cross-cultural perspectives on suffering, healing, and the human condition. Through readings in medical and social history, students explore the ways in which illness is represented in literatures from different cultures, how the practice of medicine reflects cultural beliefs, and how these beliefs have changed over time. Since illness is a “call for stories”, we pay special attention to the ways in which story uncovers the personal, familial, and social dimensions of illness - and even participates in the rituals of recovery.

450.533  **Voices of Slavery in American Literature & History**

This seminar will explore the literary legacy of American slavery through first-hand accounts, through major American novels, through historical records (including photographs), and through music, especially spirituals. Readings will include selections from the WPA interviews of former slaves recorded and transcribed in the 1960s; short fiction authored by former slaves (Frederick Douglass, William Wells Brown, Harriet E. Wilson); and modern novels by black and white authors, including Mark Twain (Huck Finn); William Styron (The Confessions of Nat Turner); and Toni Morrison (Beloved, A Mercy). At each seminar, students will provide short reports accompanied by visual images (we will use a blog) on such subjects as the documentary record of the Turner rebellion, the
practices of slaveowners, black militia in the Civil War, and the underground railroad. Writing will include in-class exercises, blog entries, and a short research paper.

450.539 1900 In Perspective: Fin-de-Siecle Culture
1900 was a pivotal fulcrum of that short but crucial era from 1890 to WW I which marked a decisive transition from the cultural landscape of the old order to the wrenching changes signified by modernism and expressionism in the arts, and the strident politics of turn-of-the-century Europe and America.

The rich interregnum between the lingering sunset of the old world and the about-to-dawn new world we call the fin-de-siecle, a brief but explosively creative age of unprecedented literary and artistic expression. It was the age of Sigmund Freud, Gustav Klimt and Toulouse Lautrec, and the boulevard life of the cafes and cabarets of Vienna and Belle Epoque Paris. It was the age of posters that featured daring cabaret performers, revolutionary concerts, and women smoking cigarettes and riding bicycles. It was the age of French-inspired art nouveau design that spread from Budapest to Chicago, and of Viennese craft design that spread from Glasgow to Frank Lloyd Wright’s Oak Park. It was the age of self-conscious decadence, as seen in writers such as Huysmans and Oscar Wilde. Students will embark on an interdisciplinary exploration that ranges through art and architecture, urban design and city planning, music, literature and popular culture, focusing on Vienna, Paris and London, with glances toward other locales for comparison.

450.565 The American Southwest: Crossroads of Cultures
“American southwest” is a study of the art, culture and history of the U.S. Southwest, from ancient Indian homeland to contemporary center of art and culture. We begin with a look at the ancient Pueblo people (the Anasazi) at major archaeological sites such as Chaco Canyon and Mesa Verde. We then turn to the historical communities of the Hopi, the Zuni and other contemporary Pueblo peoples of New Mexico and Arizona, as well as the Navajo and Apache. We read the narratives of the earliest Spanish arrivals, and examine the long tradition of Spanish colonial art and architecture in the Southwest. Following the Mexican-American war, the 19th century saw the arrival of the railroad and an Anglo population of Easterners, and the “Santa Fe-ization” of the Southwest. More recently, the area has witnessed the “re-arrival” of a Mexican-American, or Chicano, population along with the revival of Mexican cultural traditions such as the Day of the Dead and the cult of Guadalupe. The course includes reading and discussion of authors as Willa Cather, Scott Momaday, Leslie Marmon Silko, and Rudolfo Anaya, and an extensive look at the arts of the Pueblo and Navajo peoples, the paintings of the Taos School and the work of Georgia O’Keeffe.

450.580 Follow the North Star: Hist,Stories of Slaves Escaping MD
The course examines the many ways in which slaves sought or were able to escape from slavery by ‘running away,’ or by assistance from nature. Included will be an examination of the ads for runaway slaves that appeared in newspapers, the stories of the ship Pearl and the brig Enterprise, the fate of slaves who fled to the British during the War of 1812, and the path to freedom followed by slaves who enlisted in the Union Army prior to Maryland’s abolition of slavery in 1864. The course is designed to broaden one’s understanding of the choices and paths enslaved Maryland residents were able to follow to freedom, from the Declaration of Independence to the case of Elizabeth Turner decided by Chief Justice Salmon P. Chase after the Civil War.

450.581 The American Revolution
This course will explore the roots of the American Revolution, comparing the perspectives of England with the colonies on the causes, comparing the positions of Loyalists and Patriots within the colonies, exploring the role of diplomacy during the revolutionary years, reviewing the war years, studying the legacy of the revolutionary experience on the social, religious, economic and political fabric of the new nation and the resulting Constitution for the United States.

450.602 Opera: Drama Thru Music
How does opera work dramatically? How does the text prefigure the music, and the music reflect that text? This seminar explores a varied group of operas from the point of view of their dramatic construction. Four of the operas are based upon prior literary sources: Donizetti’s Lucia di Lammer moor (1835), Sir Walter Scott), Bizet’s Carmen (1875), Verdi’s Otello (1887, Shakespeare), and Britten’s The Turn of the Screw (1954, Henry James). A fifth opera, Mozart’s Così fan tutte (1790), will be studied for comparison, as an example of an opera without specific literary antecedent.

450.604 Earth: History, Art, and the Material Culture of St. Peter’s and the Vatican
This course will explore the spectacular historical, cultural, and artistic spaces that comprise the Vatican in Rome, in particular St. Peter’s Piazza and Basilica, the Papal Palace, and the Vatican Library and Museum. Our central concern will be to examine the material culture of the Vatican; meaning its physical and visual manifestation through architecture, sculpture, painting, decorative arts, books, manuscripts; and to explore this unique effort to manifest the most heavenly and spiritual spaces on earth. While greatest emphasis will be placed on the Renaissance and Baroque periods, ca. 1475-1650, this course will also include an overview of the history of the Christianity (and, by extension, the history of the papacy) from its early Christian origins in ancient Rome, through the Protestant Reformation, and onwards to the foundation of the Vatican Museum during the Enlightenment. This is also very much a hands-on course as well, and will therefore involve regular interaction with medieval, Renaissance, Baroque, and Enlightenment-era rare books and manuscripts directly related to the Vatican in the collections of the Sheridan Libraries (in the newly built Brody Learning Commons on the Homewood Campus), in addition to a special visit to the Walters Art Museum.

450.605 Religion and 20th Century Drama
A study of selected twentieth-century European and American plays representing a broad range of religious and philosophical points of view, oriented toward gaining critical perspective on the spiritual world of that time. Students will read and discuss several plays, some explicitly religious, some anti-religious,
and some touching issues and themes of religious/spiritual importance. Plays to be studied will include: Robert Bolt, A Man for All Seasons; T.S. Eliot, Murder in the Cathedral; Jean Anouilh, Becket; Jean-Paul Sartre, The Flies; Arthur Miller, The Crucible; Eugene Ionesco, Rhinoceros; Berthold Brecht, Galileo; John Millington Synge, Riders to the Sea; Federico Garcia Lorca, Blood Wedding; Edward Albee, Who’s Afraid of Virginia Wolf; and Samuel Beckett, Waiting for Godot, among others.

450.606 Ethics for a Multicultural World
This is a course in applied philosophy, a practical approach to ethical thinking based principally on the Discourse Ethic of Jürgen Habermas. Using a “Moral GPS,” the course works through the basic steps of a discernment and decision process that takes into account the particular ethical challenges of the 21st-century multicultural world.

450.607 Through a Glass, Darkly: American Film Noir
The term film noir, French for “black film,” was first applied to Hollywood films by French critic Nino Frank in 1946. Unrecognized by the American film industry as a distinct formula during the classic period of Hollywood (1930-1960), Cinema historians and critics defined the category retrospectively to describe the distinctive style look and feel of many American films made during the 1930s, 1940s, and 1950s. The course examines the cultural origins, unique elements, underlying values, and major auteurs of both American noir and international noir filmmakers. Among the films considered are Fritz Lang’s M (Germany-1931), John Huston’s The Maltese Falcon (U.S.-1941), Orson Welles’ Citizen Kane (U.S.-1941) and Touch of Evil (U.S.-1958), Robert Aldrich’s Kiss Me Deadly (U.S.-1955), and Francois Truffaut’s Shoot the Piano Player (France-1960). The course will conclude with analysis of neo-noir films like Sam Fuller’s Underworld U.S.A. (U.S.-1961) and John Frankenheimer’s The Manchurian Candidate (U.S.-1962) among many others.

450.608 Judaism, Christianity, Islam
Despite over a thousand years of conflict both external and internal, Judaism, Christianity and Islam share doctrines and practices. Students will examine the essential teachings of the three great Abrahamic religion concerning revelation, scripture, sacred geography, worship, prophecy, holy war, divine justice and judgment, blasphemy (including sacrilegious humor), and the afterlife. Readings will include selections from the Bible, Qur’an, St. Augustine’s The City of God, Moses Maimonides’ The Guide for the Perplexed, The Alchemy of Happiness by Abu Hamid Muhammad al-Ghazalli, as well as the contemporary classics What Do Jews Believe? by Rabbi David Ariel, Introduction to Christianity by Joseph Cardinal Ratzinger (Pope Benedict XVI), and The Heart of Islam: Enduring Values for Humanity by Seyyed Hossein Nasr. Visits to a synagogue, church, and mosque for a service of worship will be required.

450.610 Twice-Told Tales: Classic Texts and their Contemporary Retellings (IC)
This course offers a comparative study of classic texts and their modern or contemporary retellings in literature and on stage and screen, with a focus on how these ancient stories, which have endured through the ages and helped define our sense of what it means to be human, have been refashioned to reflect modern realities. Examining “second stories” provides the pleasure of seeing the familiar from a fresh and surprising perspective (e.g., the wanderings of Odysseus seen through the eyes of his stay-at-home wife, Penelope) and also allows us to study the cultural content of the tales through a bifocal lens. How does the political protest of Sophocles’ Antigone change its thrust when it is retold by a 20th century French existentialist writing during the Nazi occupation of France? Our twice-told pairings are Homer’s Odyssey and Margaret Atwood’s Penelopiad; Sophocles’ Antigone and Anouilh’s Antigone; Shakespeare’s The Tempest and Frederick Buechner’s The Storm; Virginia Woolf’s Mrs. Dalloway and Michael Cunningham’s The Hours. Note: This course satisfies the Interdisciplinary Core requirement.

450.611 Social History of Medicine
This course focuses on major developments in modern medicine from the Enlightenment to the late 20th century and considers those developments within their social, political, cultural, and economic contexts. The focus is on the growth of scientific medicine. However, the parallel growth of lifestyle choices and holistic medicine is also important. Some of the themes of the course are: the development of the medical profession and institutions; changing concepts of insanity; the impact of industrialization and the linking of dirt with disease; drug discoveries and their consequences; the impact of eugenics theories; gender and medicine; war as a catalyst for medical innovation; growing government involvement in health care provision as well as socialized medicine and its relevance today.

450.612 Great Ethical Philosophers
Are there absolute moral laws that dictate how one ought to behave, or is correct behavior relative to ever-varying circumstances? Is there a type of life that is best for all human beings? Ought one to promote solely one’s own self-interest, or does one have a duty to sacrifice for others? Students discuss how these and other ethical questions have been addressed by Plato in the fourth century B.C., Kant in the 18th century, and Nietzsche in the 19th century.

450.613 British Victorian Women
This course embraces the broad sweep of primarily British Victorian women’s experiences. It analyzes the emergence of the Victorian stereotype of middle and upper class women and compares that stereotype to the reality of individual Victorian women’s experiences. It analyzes the emergence of the medical profession and institutions; changing concepts of insanity; the impact of industrialization and the linking of dirt with disease; drug discoveries and their consequences; the impact of eugenics theories; gender and medicine; war as a catalyst for medical innovation; growing government involvement in health care provision as well as socialized medicine and its relevance today.

450.616 Modern Irish Literature
Though geographically small, economically depressed, and politically troubled, Ireland has produced four Nobel Prize winners. This class examines three representative works of each literary genre, including poetry by W.B. Yeats, Thomas Kinsella, and Seamus Heaney. We discuss George Bernard Shaw’s
little-known (and only “Irish” play) John Bull’s Other Island and Brian Friel’s recent Broadway hit, Translations. For their papers, students analyze an Irish play by another dramatist (e.g., O’Casey, Synge, Wilde, Beckett, or McDonagh) and compare stories in James Joyce’s Dubliners with those by his Anglo-Irish contemporary, Elizabeth Bowen, and the current writer William Trevor.

450.617 Crime, Justice and the Constitution
Examines how the Supreme Court establishes and enforces the constitutional rules that govern law enforcement in the United States, including the 4th Amendment’s provisions on searches and arrests, the 5th and 6th Amendment protections for individuals charged with a crime, and the 8th Amendment’s requirement for bail and its ban on cruel and unusual punishments. We will also examine what it means to have a fair trial, the process of plea bargaining which resolves most criminal cases, and the continuing controversy over criminal sentencing. And we will continually be exploring the meaning and the reality of “justice.”

450.619 Revolutions of the Book: The Transformation of Knowledge in Europe from Antiquity to the Renaissance and Enlightenment
This course will explore how intersection of transformations in the technologies and arts of communication with transformations in ideas—a topic of particular relevance today, much as it was long ago. The entire course will be taught directly from original rare book and manuscript materials in the collections of Johns Hopkins University. We will begin with the history of writing, from the cuneiform tablets and papyri in the ancient world, to illuminated manuscripts of the Middle Ages, on to scribal traditions of the Renaissance. We will also explore myths of writing as well, in particular ancient pagan and early Christian mythologies which sought to explain how letters, words, and languages were “invented” and “discovered” through the medium of the newly restored fresco cycle in the Vatican Library’s Salone Sistino.

450.620 Art: Burgundy 1364-1477
The court established by the Valois Dukes of Burgundy (1364-1477) was one of the wealthiest and most politically ambitious courts in the history of Europe. This seminar explores the opulence and diversity of art works commissioned by and for the Valois dukes, and by members of their court circle. Topics include: painting, sculpture, manuscripts, and architecture; daily life and devotional practice; portraiture; and the emergence of a distinctive Burgundian style. With a format combining illustrated lectures, student-led discussions, and gallery visits, this course will be taught at the Walters Art Museum, and will draw from the collections of the Walters and of other museums. A general background in Medieval art and/or history is recommended. Reading knowledge of French will be beneficial.

450.621 The Self in Question: Readings in Lit & Psychol
This is an interdisciplinary core. What is the nature of the self? For Plato, the self is a sleeping giant; for Buddha, it is an illusion; for Freud, it is instinctual hunger; for Schopenhauer, irrational will; for B. F. Skinner, it is a machine; for Buckminster Fuller, it is a verb; for Sartre, it is a useless passion. Thinkers throughout the ages have probed the riddle of our human identity, and today, the dimensions of this age-old quest have been expanded to include the formative roles of gender, class, race and culture. From ‘selves in the making’ to ‘selves under siege,’ from the lonely, existential self to the transpersonal, communal self, in this class we explore questions of selfhood from the perspectives of literature and psychology—two key disciplines devoted to understanding the perplexities of human nature.

450.623 The Theater of Revolt: Makers of Modern Drama
In this course we study the playwrights whose intellectual brilliance and moral passions created a revolution in traditional theater, unleashing energies that continue to drive theater a century later. We will read major plays of Ibsen, Chekhov, Pirandello, Shaw, Brecht, and O’Neill in the context of their social/historical settings to understand how shifting philosophical, cultural, and scientific views required new ways of staging human stories, prompting innovations in both subject matter and technical form. Because drama is primarily a performance art, we will spend time comparing versions of the play on the page‘ with the play on the stage.’ Our alternate-weekly, extended-class format will afford us the opportunity to analyze scenes from distinguished theater performances that have been captured on film.

450.624 Contemporary American Playwrights
This course offers a study of five contemporary American playwrights whose works further the tradition of 19th century realism while at the same time employing the experimental forms of 20th century absurdist theater. In the spirit of Ibsen, Shaw, and Brecht, these playwrights stage the social problems of our time: racism, homophobia, sexual politics, violence, and the culture wars—and offer us fresh perspectives on these pressing issues. The featured playwrights are August Wilson, David Mamet, Sam Shepard, Wendy Wasserstein, and Tony Kushner. This course also includes one day at the Contemporary American Theatre Festival in Shepherdstown, West Virginia, where students will attend plays and meet with the CATF directors and actors. This is a required field trip for this class and students will be required to pay a $50 activity fee to cover the cost of seeing three plays. Please note that we are getting a special JHU student rate.

450.625 Bioethics
This course draws upon key concepts in philosophical analysis, particularly ethical theory, to address the myriad of complex moral issues that arise in the biomedical field. Assigned reading includes relevant works in philosophy by Aristotle, Kant, and Mill, as well as those by contemporary bioethicists. In this context students discuss such issues as death and dying, in vitro fertilization, human cloning, physician-assisted suicide, and experimentation with humans and animals.

450.627 Cooper, Twain: Frontier
James Fenimore Cooper wrote the five Leather-Stocking Tales between 1823 and 1841 (The Last of the Mohicans is the best known of the novels). Cooper created Natty Bumppo (Hawkeye), friendly and unfriendly Indians, and settlers, including women (Cooper liked to call them “females”),
to tell his version of the country’s expansion west. Cooper’s portrayal of Indians and women has been challenged, but this first American novelist was widely read and has left an enduring (though not necessarily accurate) image of life on the frontier. Mark Twain published The Gilded Age in 1873 when the frontier was disappearing and a less rural America began to emerge. Arguably the greatest of all American humorists, not withstanding the huge achievement of Huck Finn (1885), Twain wrote novels, short stories, and nonfiction and was given to such sentiments as “Clothes make the man. Naked people have little or no influence in society” and “Familiarity breeds contempt and children.” And Twain’s critique of Cooper was a masterpiece.

450.629 Reading Washington
From Frederick Douglass to Gore Vidal, from Rachel Carson to Edward F. Jones, the nation’s capital has been the home of or setting for some of America’s finest writers and writing. This special, elective course focuses on everything in DC from mystery and politics to the inner city and the plight of immigrants. This course will meet for one week from June 15-21, 2014, in an all-day format; students must attend from 9 a.m.-4 p.m., plus some evening events. The reading will be cross-concentration, supplemented by author visits, field trips, and special surprises. Student should complete all reading before this intensive course starts. This course combines some events with students in the Science Writing Residency Course; both courses make up the 2014 Hopkins Conference on Craft. See http://writing.jhu.edu/craftconference for more information. $200 conference fee required.

450.630 Orientalism” vs. “Occidentalism”: A Brief History of Two Illusions
This course examines the evolution of regional attitudes that shape national discourses that create global discourse that influece the ways peoples and therefore nations at both ends of the Eurasian continent perceive and deal or do not deal with each other. Primary focus will be upon the sectarian religious, ethnic, social-economic conflicts that frame popular images, upon competitive power groups, international and domestic, that manage and model leadership polities and upon the domestic and international press that play a significant role in shaping public perceptions. Students will view documentaries and films, read, weigh, consider and discuss a wide range of literary and media sources, including a film based upon Kipling’s “The Man Who Would Be King” and other films, essays by world leaders from the 19th-century father of modern India, Raja Rammohan Ray and Henry Louis Vivian Derozio, to the 20th and 21st century writers such as Kishore Mahbubani (Can Asians Think), Steward Gordon (When Asia Was The World), Edward Said, (Orientalism), and Ian Buruma and Avishai Margalit (Occidentalism, The West in the Eyes of Its Enemies).

450.631 Western Theatre History: The Dynamic Interplay of Social, Economic and Cultural Forces
Theatre offers unique insight into the development of western civilization by depicting people in their relationships to themselves, to each other, and to society. Theatre history provides a distinctive lens through which to explore the social, economic, cultural, geographical and other forces shaping those relationships over the past 2500 years. Beginning with the inception of theatre in religious ritual up to the present postmodern era, Western Theatre History: The Dynamic Interplay of Social, Economic and Cultural Forces will explore the demographics of audiences, the reasons for attending the theatre, who presented theatre, where theatres were located, what theatre space looked like and why they looked that way in order to track the dynamics of western political and social history. Major works of dramatic literature will serve as the entry point into various periods and as reflections of the historical forces at work. The major periods to be studied are: Classical Greek and Rome, Medieval, Renaissance (Italy, England and Spain), 18th and early 19th centuries, the modern era and the postmodern present.

450.634 Italian Renaissance Art and Thought
In what sorts of intellectual contexts was Italian Renaissance art produced, and received? What, in other words, were the connections between Renaissance art, philosophy, theology, mathematics, rhetoric, and history? This seminar will investigate a number of answers to such questions, through a consideration of primary evidence and recent scholarship. Among other things, we will consider Aristotle’s theory of magnificence as it was applied to Renaissance architecture, the development of perspectival systems, the notion of a Renaissance or golden age, and Vasari’s efforts to conceptualize art of the Renaissance in metaphorical terms. Several substantial writing assignments will allow students to develop critical positions of their own, and throughout the term there will be an emphasis upon close reading of both texts and artworks.

450.635 Modern English Literature
This course investigates a wide range of twentieth-century English works in all genres of imaginative literature. In regard to poetry, students discuss selections from Thomas Hardy, W.H. Auden, and Stevie Smith to Carol Ann Duffy, England’s first woman Poet Laureate, appointed last spring. Then they analyze three novels: E.M. Forster’s Howard’s End, Virginia Woolf’s Mrs. Dalloway, and Anthony Burgess’s A Clockwork Orange. The syllabus concludes with the plays The Birthday Party by Harold Pinter, Arcadia by Tom Stoppard, and Top Girls by Caryl Churchill.

450.637 Modern American Poetry: From Robert Frost to Natasha Trethewey
The clichéd era of effete poetry by dead white males read by little old ladies in sewing circles has long passed. The current U.S. poet laureate is Natasha Trethewey, an African-American woman from Mississippi. Barack Obama’s 2013 presidential inauguration featured a poem by Richard Blanco, the son of Cuban exiles and an openly gay, former engineer. Four years earlier, President Obama asked Elizabeth Alexander, an African-American professor from Yale University, to read her “Praise Song for the Day”. Bill Clinton’s presidential inaugural poets were Maya Angelou (1993) and Miller Williams (1997). As diverse as these poets are, they nevertheless follow artistic forms established by one of the early founders of modern American poetry, Robert Frost, selected in 1961 by President John F. Kennedy as the first U.S. Inaugural poet. This course
will explore American 20th- and 21st-century poetry from early modernist luminaries like William Carlos Williams and Elizabeth Bishop through U.S. poet laureates still writing today, such as Rita Dove and Philip Levine.

450.638 What Is History?
How do historians evaluate evidence and draw conclusions about the past? How persuasive is the thesis of Simon Schama’s Dead Certainties that “the asking of questions and the relating of narratives need not be mutually exclusive forms of historical representation,” and that history ultimately must be “a work of the imagination”?

450.641 Food and Politics
Food is central to our daily lives, yet few of us consider the political implications of what we eat. In fact, numerous political struggles take place over the production and consumption of food. These range from global conflicts over agricultural subsidies or genetically modified foods to more local concerns about food safety or the rising incidence of obesity among children and adults. Over the course of the semester, we will address these debates with two goals in mind. On the one hand, we will consider what is special or unique about food and agriculture as a distinct area of policy. On the other hand, we will attempt to draw larger lessons from the politics of food about the character and operation of political institutions and the public policy process.

450.643 Reading Photographs
A photograph can tell many stories: one the photographer aims to communicate, one through the lens of culture and one through the eyes of the viewer as influenced by his or her own personal history. Students will learn the basics of photographic criticism as they address the ethics, aesthetics and politics of image-making. Class discussions will consider images as varied as Sandy Skogland’s bathroom fill with eggs, nudes and snakes to Barbara Krugers provocative advertising inspired image and text, to the symbolic nature of photographs taken in the Abu Ghraib prison in Iraq. Students will have the opportunity to discuss the artistic process with visiting guest artists who will display their work. They will also view and discuss several films: La Jette by Chris Marker, a science fiction story told in still photographs, Eloquent Nude: The Love and Legacy of Edward Weston and Charis Wilson and El Dia Que Me Quieras (The Day You’ll Love Me) a meditation on the death photograph of Che Guevara. Through informed discourse, students will interpret, evaluate and theorize about photographs culminating in a semester-long research presentation on a photo-related subject of their choice.

450.645 Documentary Photography
Documentary photographs inform, entertain, and enlighten us on subjects as diverse as civil war battlefields, Alabama sharecroppers, and outer space. We will explore different genres of documentary photography including: the fine art document, photo-journalism, social documentary photography, the photo essay and photography of propaganda. We will look at the relationship of image and text in the works of Walker Evans and James Agee. “Let us Now Praise Famous Men” and “Minimata” by Alileen and Eugene Smith. Students will work on a semester-long photo-documentary project on a subject of their choice.

450.646 Religion of Politics, Politics of Religion: Conflict and Convergence in Sacred Authority and Temporal Hierarchies
This course examines patterns of authority that evolve from interpreting the great texts to developing contemporary global cultural hierarchies. Special focus will be directed to two dominant competing 20th-21st century authority systems, one represented by Mahatma Gandhi’s satyagraha nonviolent program for social change, the other by Seyyid Qutb’s (ideologue of Ikhwan, Muslim Brotherhood) program for violent change. These two competing ecumenical ideologies and their secular versions, not geography, religious orthodoxies or ethnic rivalries, represent the great divide in global relations and within societies today, since both provide opposing models for radical social change within the same developing world, often religious, communities. Students will evaluate this and other contrasting themes through reading, discussion and case studies from contemporary India, America, South Africa, Pakistan, Afghanistan, and Egypt.

450.647 The Impressionist Era
In 1874 a group of young painters defied the official Salon in Paris and organized an exhibition of their own. Reacting against the rigid standards of the French Academy and the emotionalism of Romanticism, the Impressionists (as they came to be called) displayed a realistic attitude to subject matter and an innovative approach to the representation of color and light. This course traces the aesthetic and historical roots of Impressionism and studies the works of its principal artists including Manet, Monet, Renoir, Sisley, Degas, Caillebotte, Cassatt and Morisot.

450.650 Cultural Eras: The 1960s
The Sixties. A collage of events, people, sights, sounds, and ideas immediately come to mind. These powerful visual representations in many ways define the history of the ‘60s. In this course we will consider the images, memories, history, and legacy of the ‘60s through an interdisciplinary exploration using literature, art, history, politics, music, and film. Cultural identity located within defining events provide the focus. Black, white, Vietnamese, astronaut, protestor, gay, journalist, soldier, woman, man, young, old. How do people see themselves within the context of larger cultural events and changes that many have labeled revolutionary? We will examine the major themes through a focus on some of the major social dramas of the period and the cultural rhetoric employed to articulate meaning including: landing on the moon, the assassination of Malcolm X, the Tet Offensive and My Lai, Woodstock, and the 1969 Stonewall Riots.

450.652 Understanding Modern Art
Paintings, prints, and sculptures represent the world as their makers see it. Some artists depict a world that is harmonious and beautiful; some depict a chaotic world; and some show a world that seems unrecognizable. No matter how the world is shown, every artist is attempting to convey complex messages. For millennia, artists communicated using the artistic vocabulary of realism. Then, a little over a hundred years ago,
realism was replaced by a plethora of new artistic vocabularies and Modern Art was born. Understanding Modern Art is not a simple process. In the first place, the word “modern” doesn’t mean contemporary. In fact, Modern Art ended in the last decades of the 20th century, when the art world entered the Post-Modern period. In addition, not all artists working in the Modern period created Modern Art (which by definition must be characterized by innovation and social comment).

450.653 Revolution in Modern World Drama
The masterpieces of modern theatre are the “canon” of works in which all students of theatre should be immersed to be able to make a contribution to the art form. In scarcely more than one century theatre has undergone several esthetic revolutions. We will look at the contending ideas of Stanislavski, Bertolt Brecht and Antonin Artaud during the 20th century, in light of works for the stage by Ibsen, Chekhov Strindberg (his late preexpressionist works), irandello, Brecht, Eugene O’Neill, Tennessee Williams, Arthur Miller, Jean Genet, Samuel Beckett (Endgame and later plays), Sam Shepard, Wole Soyinka, and Caryl Churchill and Brian Friel. The course concludes with group presentations, and “model books” for proposed productions.

450.654 Science Fiction Film in the 20th Century
Interdisciplinary Core - This course provides a survey of Science Fiction Film from the early part of the 20th century through 2001. We will look at influential filmmakers including George Melies, Fritz Lang, Stanley Kubrick, George Lucas, and Steven Spielberg and will analyze the basic components of the genre through science fiction “classics” like A Trip to the Moon, Metropolis, The Day the Earth Stood Still, Invasion of the Body Snatchers, A Clockwork Orange, Dr. Strangelove, Star Wars, Blade Runner, and The Matrix among many others. The goal is to develop critical analytical skills in understanding the role of science fiction within culture. What is the “science” that drives the science fiction and what does it mean to be human? What is the view of the future, of technology? How are cultural and social concerns expressed through genre? The films and filmmakers are placed within a larger historical, cultural, and social context as we explore film as an industry, as a technology, as a form of communication, and as an artifact of culture.

450.656 American In Literature
What does it mean to be an American? Some scholars have found a “national character,” others have argued that “national character” does not exist; perhaps, given our diversity, we have multiple “characters.” In this course we will use American fiction (novels) to find (if we can) the answer, an answer, perhaps many answers to this question. Likely, we will raise some questions of our own. Our Americans will be male and female, black and white, young and old, good and evil, rich and poor, and, well, Americans.

450.657 Intro World Religions
This course surveys the 11 traditional historical religions of the world [Hinduism, Zoroastrianism, Jainism, Buddhism, Sikhism, Taoism, Confucianism, Shinto, Judaism, Christianity and Islam] in terms of history, doctrine and practice. The course begins with the classification of the religions of the world into certain families and looks into the ethnolinguistic composition of the world.

450.660 Extreme America: Political Extremism in the U.S., 1870-1920
For many of us, politics seem especially polarized at present. But in the half century between 1870 and 1920, socialism, anarchism, and communism were real presences in American life, not just smear words. On the right, racism was open and openly defended, respectable figures argued that there was too much democracy and that the “unfit” (including many of our ancestors) shouldn’t be allowed to reproduce. This course will examine political extremism in this extraordinary period with an eye toward understanding the causes and consequences of a political culture of extremism.

450.661 History of Russia
This course will first address the issue of Geography, which more than history dominated the thinking of the Eurasian Steppe, a centrifugal plain which caused the people to adopt centripetal institutions; it will include study of the region of Siberia—the land of the Shaman east of the sun; the constant stream of foreign invasions throughout Russian history and their indelible marks on the character and culture of the people; the periodization of important leaders (Peter the Great, Ivan the Terrible, Catherine the Great, etc.) of Russian History; the enormous contribution of its 19th century literature (Pushkin, Dostoevsky, Tolstoy, Chekov, etc.); the spiritual influence of the Russian Orthodox Church; the causes and effects of the Russian Revolution in 1917—and arguably the most important world event in the 20th Century; Stalin, Khruhachev and the age of the Cold War; and the Post-Communist search for identity (Gorbachev, Yeltsen, Putin, and Dimitry Medvedev).

450.662 Eastern Religions/Ethics
Is there a universal code of human conduct? How do the Easter religions differentiate right from wrong? What connections do they posit between individual and social morality? This course examines these and other issues in the ethical teachings of classical and modern Hinduism and and Buddhism to suggest alternatives to—and add perspectives on—current Judaic, Christian, Islamic, and secular ethical views.

450.664 Ideas of Justice
This would deal with conflicting ideas about justice, as they have come down to us in political philosophy, often as influenced by religious thought. We will focus on ideas of what philosophers call distributive justice, that is, ideas as to what ways of distributing wealth and other advantages in society are just (e.g., can it be just for society to allow there to be sizable inequalities among its members?). Connected with this is an ideas about property rights, and as to the nature of rights in general. In discussing these matters it would be important to notice the differing ways in which thinkers have tried to argue for the views they advocate, and to ask whether there is a correct way of arguing about such views. Readings could be from Plato, Aquinas, Hobbes, Locke, Mandeville, Rousseau, Smith, Mill, Rawls, Nozick, and others.
tragedy is at the root of the problem of governance in both states. Students will examine the continuing social, cultural and consequent constitutional crises in these two Silk Road hub-Great Game battleground territories through study of the historical religious, literary-artistic, geographic, environmental, natural resources, ethnographic, economic, social institutional, regional-international relational, and current constitutional contexts. Special attention will be given to the 2008 Pakistan and 2009 Afghanistan national and regional assembly election outcomes.

450.673 Monstrosity & Metamorphosis: Imagining Animals in Early Art & Literature
From man’s earliest artistic expressions on the walls of caves, animals have figured centrally in the human imagination. One can argue, in fact, that much of early art and literature does not differentiate fully between the human and the animal, that human self-awareness evolved, in part, through interactions with animals, and through the imaginative fusion of human and animal forms. This seminar will study the representation of animals, and human/animal hybrids, in cave painting, in Sumerian art, in Egyptian mythology, in classical mythology (Creté and the Minotaur, tales from The Odyssey, tales from Ovid’s Metamorphoses), in the Anglo-Saxon epic Beowulf, in a selection from Chaucer’s The Canterbury Tales, and in the monstrous creatures that decorate the margins of medieval manuscripts in the Christian West. The seminar will use a blog for the posting of texts and images, and will require a research paper.

450.677 Place & Vision in Contemporary World Literature
We all have places we call home, places we love, places we fear. In this course, we explore the human experience of “place” in contemporary world literature. Drawing on contemporary theories of place relations, we look at the ingredients that give a place its identity -the intersections of geography and culture, the ties of memory and desire, the deep-rooted claims of community. We examine the ways writers inscribe ‘place’ as a shaping force of character, situation, and personal vision. Finally, we examine the psychic landscape of “placelessness” in narratives of dislocation and war. Writers include Barbara Kingsolver, Jean Rhys, Bobbie Ann Mason, James Agee, Wole Soyinka, Manil Suri, Carlos Fuentes, Louise Erdrich, Tim O’Brien, Cormac McCarthy.

450.678 Religions of the Emerging World
The emerging world of the 21st century is globally interconnected: all peoples are now neighbors. In this world, competing religious claims to unique truth pose a serious threat. Yet abandoning such claims can reduce religions to quaint cultural relics. How can religious believers maintain the vitality of their spiritual heritage while fully appreciating the faith/wisdom traditions of others? This course explores the insights of one man who has sought that balance of religious consciousness—philosopher Huston Smith—as he reflects on Hinduism, Buddhism, Confucianism, Taoism, Judaism, Christianity, and Islam. Rather than competing, he found, the world’s religious traditions can greatly enrich one another.
**450.679 Character In Shakespeare**
This course will consider Shakespeare as a playwright in his own time with particular attention to his remarkable innovations in creating psychological dimensions for his dramatic characters. In lectures, readings, and discussion we will examine early modern concepts of psychology, as well as works by Plutarch and Montaigne that influenced Shakespeare's approach to personality. Several plays will be analyzed closely, including Antony and Cleopatra, Coriolanus, and Hamlet.

**450.680 From Jerusalem to Graceland**
A familiar but puzzling phenomenon of American popular culture is the secular “canonization” of Elvis Presley. This seminar will explore the belief, ritual, and art associated with all those people, places, and things that have been revered as holy, from the earliest centuries of Christianity. And from this historical probing will be extracted a religious/anthropological “model” by which to deconstruct Elvis and Elvis-like examples of secular “sacralization” in contemporary life. Students will come to understand the significance of pilgrimage, relic, votives, sacred souvenirs, miraculous healing, and supernatural apparitions, as well as devotional images (icons), sacred time, and the literary genre of the “Saint’s Life.” After drawing this all together in the lives and sacred places of the early saints of the Church, and then seeing many of its essential elements replicated in Elvis and at Graceland, students will be challenged to extend their new-found understanding and analytical skills to other “holy” people and places of our times, from Princess Diana to Ground Zero.

**450.682 The American Presidency**
This course is an introduction to the study of the presidency. Part one of the course examines how the office of the presidency became the central focus of the American political system and how the presidency developed various resources beyond the formal constitutional powers of the office such as party leadership, control of the executive, and relations with the public. Part two explores how presidents engage the broader political system and its relations with Congress, the press, the broader public, and the bureaucracy. Part three questions the sources of successful presidential leadership and examines whether presidential leadership hinges on personal skill, particular electoral or political circumstances, or an incumbent’s position within a larger partisan context of American politics. The class concludes with a consideration of presidential “greatness” and asks whether such a goal is attainable (or desirable) given the complex environment of contemporary American politics.

**450.685 Arts of the Islamic World: Politics, Display, & the Museum**
This class engages the student with Islamic art by focusing on collecting patterns and display in American and European museums from the nineteenth century to today. Collections and installations of Islamic art at such museums as the Walters Art Museum, the Freer Gallery and Arthur M. Sackler Gallery, the Textile Museum, and London’s Victoria and Albert Museum will be addressed against the background of past and contemporary engagements with Asia. Special emphasis will be placed on re-installation and traveling exhibitions in Europe and America in the post 9/11 context. At the end of term, the student will be asked to design galleries that address the need for greater understanding of Muslim societies. Background in Islamic art not needed for this class.

**450.687 Art And Mythology**
The subject of Greek art is Greek mythology. Images of Achilles and Athena, Herakles and Aphrodite, amazons and centaurs are common in vase painting, mosaics and sculpture. None of these figures was obscure to the ancient Greeks: everyone knew the stories that made up their astonishingly complex body of myths. In one sense Greek myths had the same cultural function as the books of Genesis in the Hebrew Bible. They described the creation of the universe and the establishment of the Olympian pantheon, explained how humans came to exist and how various groups were related to one another, and addressed moral issues such as honesty, pride and jealousy. But there is one significant difference. In the Judeo-Christian world, artistic depictions of Bible stories (when allowed) reinforce spiritual and ethical concepts. When the Greeks illustrated their myths, however, they were communicating social and political norms. When Classical Greeks visited great monuments they read messages in the choice and placement of the sculpture on the buildings. Similarly, when a Greek man chose a decorated wine cup, he was intentionally communicating more than a simple appreciation of the painting. In this course we’ll explore the multifaceted purposes and meanings of Greek myth in Classical Greek society. Students will read and discuss the major Greek myths and legends, and will study selected works of art that illustrate them.

**450.688 Violence to End Violence: Slavery, Anti-Slavery and the Coming of the Civil War**
The period between 1828 and 1865 was one of the most tumultuous eras in American history. At the center of this turmoil were slavery, a new, more militant antislavery movement, and an extraordinary amount of violence that each generated. This course looks at that violence--and at alternatives to it—in order to examine a number of questions of contemporary, as well as historical, significance. Some of them are: When and why do men and women resort to violence to achieve group goals? What are the consequences, intended and unintended, of using violent means to achieve a group's ends? What alternative to violence were there at particular historical moments? Who condemned or supported violence, and for what reasons?

**450.690 Literature of Existentialism: An Interdisciplinary Exploration**
An important current of thought in mid-20th-century European and American culture focused on abstract ideas but on actual living in the world with others. Human existence was the proper subject of thought—in all its messiness and in all its beauty. The proper method of thought required the personal engagement, in contrast with the “objectivity” of rationalism. Unfettered by conventional philosophic structures, Existentialism expressed itself in novel and drama as well as philosophic essay. Free from system or orthodoxy, Existentialism ranged from religious to atheistic and reached...
insights as deep as any in the history of philosophy. This course is not a survey. Rather it encounters selected 20th-century Existentialist writings, inviting participants not only to gain knowledge but also to experience a powerful mode of thought. Writers studied include Karl Jaspers, Martin Buber, Martin Heidegger, Jean-Paul Sartre, Albert Camus, Simone de Beauvoir, Eugene Ionesco, Franz Kafka, Samuel Beckett, and others.

450.692 Shakespeare: Tragedies, Histories
This class involves close and careful reading of selected tragedies and plays about English history by the world’s greatest playwright. We will also look at source documents from which Shakespeare drew his plots to learn something about the magic of creativity. Moreover, we’ll examine selected contemporary accounts of the English or Roman history and sample the current criticism of this body of work. The goal is to understand why people consider Shakespeare the greatest playwright ever – what is it that makes Shakespeare Shakespeare. A related goal is to reflect on the many ways in which these plays, written as the sixteenth century turned into the seventeenth, resonate in our culture as we struggle to get a handle on the twenty-first century. To do this, we’ll discuss film adaptations of Shakespeare’s work, and students will have an opportunity to write about a film version of a play of their choice. Assignments include reading about ten plays, weekly blogging, a final exam, a brief paper on film, and a research-based analysis. The most important thing, however, is close reading and reflective conversation. Works considered include: Richard III, Richard II, Henry IV (part one), Henry V, Julius Caesar, Hamlet, Othello, King Lear and Macbeth.

450.693 A Comparative Look at the Manuscript Book
Drawing upon the world famous collection of illustrated manuscripts at The Walters Art Museum, Curators Amy Landau and William Noel will discuss the manuscript book from Paris to Persia. For one thousand years the manuscript was the principle vehicle for the dissemination of ideas and artistic tastes throughout Europe and Asia. In this class, accessing original works of art, students will discover how books were made, used, and valued in their respective cultures. Topics to be addressed include: the materials and methods of book production; the significance and development of the book in religious and non-religious contexts; styles of scripts and illustration; as well as later responses to the manuscript, including the re-visitiation of codices, circulation of books as commodities and diplomatic gifts, and the manuscript book’s preservation and adoration in public and private collections. Discussing such topics, we shall explore both similarities and differences in approaches to the manuscript book in the western and Islamic traditions. This class offers students the unique opportunity to study manuscripts first hand.

450.703 Philosophy, Faith and Fiction in Tolstoy and Dostoevsky
This course offers an intensive study of two authors acknowledged to be among the world’s greatest novelists. Tolstoy and Dostoevsky are not only literary giants, but also existential thinkers and spiritual seekers who wrestled in their private lives and in their fictions with the mystery of what it means to be fully human. We will combine a close reading of selected texts with a cultural exploration of the powerful cross-currents of 19th century Russian thought, and we will also pay attention to the dramatic life stories that helped to shape these authors’ passionate but unconventional religious beliefs. Readings by Dostoevsky are: The Brothers Karamazov and two short classics “The Double”, and “Notes from Underground”. Readings by Tolstoy are Anna Karenina and two short classics “The Death of Ivan Ilyich” and “Master and Man”.

450.704 Poetry and the Visual Arts (IC)
This seminar will explore relationships between the languages of poems and those of the visual arts, including painting, drawing, sculpture, and photography. We will begin by discussing theoretical essays contrasting verbal and visual artistic expression, and go on to consider, for example, poems based on paintings (Auden’s “des Beaux Arts” and Breughel’s “Fall of Icarus”); poetic images that make use of a pictorial tradition (Chinese ink painting in Li-Young Lee’s “Persimmons”); reciprocal tensions in the poetry and visual art of a single artist (Derek Wolcott); the use of similar techniques, such as the symbolic coding of color, in poems (Wallace Stevens) and in painting (Marc Chagall); and the individual responses of several poets to the same work. The class will use a blog for the posting of visual images and other class-related materials. Requirements will include short papers/commentaries, and one long paper.

450.705 Art Collectors and Collections
Using the museums of the Washington/Baltimore area as classroom, this course traces a dual path through the history of art (particularly Renaissance to Modern painting) and the history of art collecting in the United States. The National Gallery will provide an overview of art history and the Corcoran, Clarke, Phillips, Freer, Hirshhorn, Walters and Cone collections will provide case studies. Issues of taste, who and what influence it, and the impact of private collections and the art museums that became their legacy on the development of American culture will be addressed. Particular attention will be paid to the choices made by individual collectors exploring the meaning and relevance of the works of art they selected to their own lives and also to the larger picture of American history during their lifetimes.

450.710 The Mind of Leonardo da Vinci
Leonardo da Vinci (1452-1519) was one of the most fascinating individuals in history. He is the creator of what are arguably the world’s two most famous paintings: the Last Supper and the Mona Lisa. He was also a brilliant scientist and engineer; he made dozens of original anatomical discoveries (for example, he injected hot wax into an ox brain to demonstrate the shape of the ventricles), and he invented hundreds of devices (from ball bearings to a steam cannon). He was well known as a musician, court entertainer, and even as a practical joker. Who was Leonardo? What do we know of his personal life, including his thoughts on religion, sexuality, or politics? What personal traits shaped his genius? This course explores his thousands of pages of manuscripts; his paintings and other artistic projects; his scientific projects (including anatomy, physiology, botany, and geology); and his civil and military engineering projects.
450.712  Cosmos & Consciousness: Perspectives from Modern Physics & Religion
What does the culture of mass-energy, space-time, the big bang and black holes have to say to the culture of myth, ritual, contemplation and prayer? And vice-versa? In this course, students are introduced to the profoundly strange realities unveiled by modern physics, and they explore the impact of quantum theory and relativity on our understanding of questions which have traditionally been the province of the world's great spiritual traditions: What is the origin of the cosmos and where, if anywhere, is it headed? Does the universe have meaning? What is the relation between time and eternity, between mind and matter? Who are we and how did we get here? In exploring these questions, students examine the problems and possibilities of finding common ground where modern science and the world's time-honored spiritual traditions can meet. This course is team-taught by a physicist and a religious studies scholar.

450.713  Shakespeare & The Film (IC)
This seminar will examine Indian, Chinese, and Japanese film adaptations of four tragedies by Shakespeare. The plays and their directors are as follows: Macbeth (Maqbool by Vishal Bharadwaj, and Throne of Blood by Akira Kurosawa); Othello (Omkara by Vishal Bharadwaj); Hamlet (The Banquet by Feng Xiaogang); and King Lear (Ran by Akira Kurosawa). Students will discuss each play prior to viewing its film adaptation(s); the seminar will also make use of a blog for weekly postings of related materials. Seminar requirements include a paper and oral report concerning the influence of an Asian native tradition on one of the films under study, such as that of Noh theater on Kurosawa's Throne of Blood, or Peking opera on Feng Xiaogang's The Banquet.

450.714  Progress & Amer Envr
Free-flowing rivers, bountiful wildlife, and sublime vistas of distant mountains? Or unlimited energy, tidy neighborhoods, and economic prosperity? Unrestricted in what we can do with our own land or inhibited by regulations designed to protect the common good? This course examines American cultural attitudes toward wilderness and nature as they have evolved through history and are expressed today in social and political decision making.

450.719  American Short Story
The distinguished tradition of the American short story has continued into the twenty-first century with recent collections by two alumni of Johns Hopkins University: John Barth (also professor emeritus from its School of Arts and Sciences) and Louise Erdrich (a descendant of the Chippewa Indians about whom she often writes). After discussing representative fiction by founders of the genre—Washington Irving, Nathaniel Hawthorne, and Edgar Allan Poe; students explore stories by a diverse group of writers including Ernest Hemingway, Zora Neale Hurston, Joyce Carol Oates, and John Updike (whose sixty-year writing career ended with his death in 2009).

450.720  Amer & British Poets
This course will examine the development of modernism in Anglo-American poetry while focusing on close readings of individual poems. Students will discuss Romantic concepts of transcendence in Wordsworth and Keats, Victorian skepticism in Arnold and Browning, and 20th-century ideas of alienation in selected works from the following group: Yeats, Eliot, Stevens, Millay, Plath, Atwood, Rich, Dove, Soyinka, Ondaatje, Li-Young Lee, and Heaney. The class will include both small- and large-group discussions.

450.726  Lost Books of the Bible
After centuries of agreement about which texts constituted the Hebrew Bible and the New Testament, modern archaeological discoveries have rekindled the profound ancient controversies about which books should be considered sacred and authoritative. The Dead Sea scrolls, for example, predate the time when the limits of the Hebrew Bible were set, and the Gnostic writings found at Nag Hammadi include forgotten gospels that once rivaled those preserved in the New Testament. In this seminar students compare the processes of inclusion and exclusion that produced the Jewish and Christian Bibles—giving special attention to the light shed by recent manuscript discoveries. Special Topic for Fall 2011: The Lost Books of the New Testament, giving special attention to The Gospel of Mary (Magdalene) and the recently discovered Gospel of Judas.

450.732  Literature of Oppression
This seminar will examine the novels of Erdrich and Morrison in terms of their depictions of the experiences of Native Americans and of black Americans, respectively. In each novel, we will consider oppression, first, from a social and historical perspective; and second, in terms of the tensions among individual characters. Novels will include Erdrich's Love Medicine and Tracks, and Morrison's Beloved, Mercy, and Tar Baby. The seminar will feature weekly discussions on a class blog; several short in-class writings on assigned research topics; and a research paper, accompanied by a short oral presentation. If possible, there will be a class excursion to the National Museum of the American Indian in Washington, DC.

450.735  Text & Image: Material Culture of Renaissance Europe 1400-1650
This course will address the history of cultural objects and artifacts in early modern Europe—from the close of the Middle Ages to the height of the Renaissance in Italy, northern Europe, and the British Isles—and their transformative, even revolutionary, impact on European culture and the history of ideas. We will interrogate and assess, in an inherently interdisciplinary way, each of the major technological and artistic innovations, socio-economic transformations, and cultural revolutions that fundamentally distinguished the Renaissance from former eras. Major themes will include: the invention of printing by movable type; the advent and progress of Renaissance humanism; the emergence of the new commercial and professional classes; the Protestant and Catholic Reformations; the Scientific Revolution; the production and circulation of literary texts; patronage of the arts; revolutions in the graphic arts; collectors and collecting books and objets d’art; literacy and evidence of historical reading practices; popular culture; riot, ritual, and rebellion in the Renaissance; the rise and consolidation of centralized states; underground printing, book smuggling, and the culture of dissidents and minorities; and arts and press censorship.
450.739  Race and Jazz
The music known as jazz has been celebrated and performed by peoples throughout the world. This course will examine the music itself as well as the role that race has played in the creation of jazz, the perception of its history, and the perceived authenticity of present-day jazz. We will examine the music from a historical perspective through the study of the music and lives of its creators and practitioners beginning with precursors in ragtime and minstrelsy and continuing into the modern era. Students will learn to make aesthetic judgments, identify various jazz styles and discuss their relevance to their time and to the present. Classes are planned to include guest artists from the Baltimore jazz scene, examples in various media and live performances by the instructor.

450.740  Film and Public Memory (IC)
Robert Rosenstone has noted that “The reality of the past --- national, familial, personal --- does not lie in an assemblage of data but in a field of stories --- a place where fact, truth, fiction, invention, forgetting and myth are so entangled that they cannot be separated.” Public Memory then emerges as the beliefs and ideas about the past told through “stories” and shared by a public or culture. This course examines the film as a form of public history; a constructed, mediated version of the events, people, and ideas of history often seamless in presentation and powerful in address. Using the organizing principle of “collective memory,” we will employ an interdisciplinary perspective to examine how histories are constructed through the filmmaking process. The film, whether feature film or documentary, has tremendous power in shaping public perceptions of key aspects of history and culture. How do filmmakers balance the demands of an accurate historical representation with film as a form of entertainment? How is the history in films judged by academics and audiences? This course fulfills Interdisciplinary Core requirements for the MLA Program.

450.749  Exploring the Liberal Arts
What do we mean by the “liberal arts” and why are they more important today than ever before? How do the humanities, social sciences, natural sciences, and arts compare and contrast in terms of their methods of acquiring, analyzing, and conveying knowledge? Are the “ways of knowing” for each discipline incremental or sudden and why or when? The course is taught using a thematic approach. Previous versions of the class have included a focus on “The DaVinci Code,” “Time,” “The American landscape and the American Imagination,” “Interdisciplinary Perspectives on the Fifties,” “Seeing,” “Memory,” and “Nature and the American Imagination.”

450.753  Idea of the South in American Literature
The American South continues to cast a powerful mystique, though its meaning can vary considerably. Whose version of the South is recorded? How do we even define “the South”? What racial, sexual, and cultural tensions lie behind the fabled magnolia trees, white-pillared mansions, and mint juleps? Since literature has always captured the complex realities beneath deceptive appearances, this seminar explores such questions in works by Edgar Allan Poe, Mark Twain, William Faulkner, Lillian Hellman, Katherine Anne Porter, Robert Penn Warren, Toni Morrison, and others.

450.754  Alienation & Deviance
Sometimes we see more deeply into our culture when we view it from the outside in, as through the eyes of those defined as deviant by American society or those profoundly alienated from it. Drawing upon history and literature, this course looks at such outsiders as “lunatics” in nineteenth-century America, Richard Wright growing up in segregated Mississippi, gay men in New York before World War II, an over-privileged prep school flunk out, and a schizophrenic young woman from a wildly dysfunctional family. To paraphrase the insight of one of our authors, the broken parts say a great deal about the machine itself.

450.759  Art of the Middle Ages
The Middle Ages—from the death of the last Roman Emperor in 476 to the dawn of the Italian Renaissance in the early fourteenth century—was characterized by Byzantine icons, Carolingian manuscripts and Romanesque sculpture. How did a distinctively Christian art grow from pagan roots? How did Medieval art develop and diverge over time in both the East and the West? What transcendent values unite medieval art whenever and however it appeared? Students discuss these and related questions in order to explore how a revolutionary new belief shaped a millennium of material culture.

450.763  Myths: Development and Significance
Myths provide profound insight into the human condition because they contain the collective wisdom of many generations. Although most modern studies concur that myths are important, there is little agreement about the best way to explain their origin and sources of power. This course explores the many modern methods employed in the study of myths and applies these methods to stories selected from African, Biblical, Greek, Japanese, Mesopotamian, Native-American, Southeast-Asian, and other mythologies.

450.764  Medicine in the Ancient Near Eastern & Classical Worlds
This seminar examines the practices of medicine in ancient Egypt, Mesopotamia, and Israel, as well as classical Greece and Rome. The primary emphasis is on early ideas about health and disease. Students discuss such issues as the practice of surgery, methods of hygiene, knowledge of contagion, definitions of illness, and concepts of ritual purity. Readings include primary texts surviving from ancient Near Eastern documents (e.g., Egyptian papyri and Mesopotamian cuneiform tablets), as well as the Hippocratic treatises and other medical literature from the Greco-Roman World.

450.765  Politics and/Culture of the Holocaust
This course examines genocide through a study of the Holocaust, both as a paradigm of state-supported mass destruction and as a unique catastrophe that continues to generate prodigious amounts of literature in such fields as sociology, philosophy, psychology, fiction, and theology. To understand better a writer’s dilemma in trying to communicate horrors that defy imagination and reason, students discuss Wiesel’s Night, Levi’s Survival in Auschwitz, Fink’s A Scrap of Time, Kosinski’s The Painted Bird, and other works. The class also analyzes films such as Immdorf’s Indelible Shadows and the video of the Wannsee Conference.
Dead Sea Scrolls
The recovery of a massive ancient library from caves near Khirbet Qumran in the Judean Desert has been described as one of the greatest archaeological discoveries in modern times. Seminar participants read the scrolls themselves in English translation to learn more about the Jewish apocalyptic in the Greco Roman period. Jewish apocalyptic is important not only as a lost chapter in the history of Judaism but also as the spiritual and intellectual context out of which Christianity emerged. Topics include the circumstances of the scrolls’ discovery, theories of their origins, their historical context, and the ongoing controversy over publication rights.

American West: Image & Reality
The American West has always exerted a profound influence on American life and thought. This course examines the importance of the frontier in 19th-century history, as well as Americans’ changing perceptions of how the West was settled. Topics include the conflict between whites and native Americans, the role of women on the frontier, the development of “civilizing” institutions like churches and schools, law-and-order justice, and the timeless distinctiveness of the West. Readings include Frederick Jackson Turner’s essay about the importance of the frontier, Julie Jeffrey’s Frontier Women, Owen Wister’s The Virginian, and Walter Van Tilburg Clark’s Ox-Bow Incident.

A Cultural History of New York City: World’s Fair to World Trade Center
This interdisciplinary course begins with a look at what architect Rem Koolhaas has called “Delirious New York,” the competitive mania of the skyscraper wars, and the rambunctious and over the top worlds of Coney Island, Times Square and Broadway theater in the early 20th century. We then turn to the decisive turning point of the 1930’s when, in the face of the Great Depression, New York City witnessed some of its greatest building projects: the Empire State Building, Rockefeller Center and the monumental projects overseen by NYC’s controversial “Master Builder”, Robert Moses. The New York World’s Fair of 1939 serves as a fitting symbol for what the Fair itself proclaimed as “The World of Tomorrow”, the world of middle class consumerism, the automobile, the highway and the suburb. A major focus of our study is the unfolding and increasingly controversial career of Robert Moses in attempting to implement this “World of Tomorrow”, and the gathering forces of opposition galvanized by the book The Death and Life of Great American Cities written by the Greenwich Village activist Jane Jacobs.

New York City: A Cultural History
In this interdisciplinary course we will explore the transformations marking the cultural history of New York City from its beginnings through the ‘Roaring Twenties.’ Starting out as “Mannahatta,” a bountiful Native American hunting, fishing and camping ground, the island at the mouth of the Hudson River has gone from the small commercial venture of Dutch New Amsterdam to the rough and tumble politics of British colonial New York, and its brief role as federal capital of the United States, to its more enduring role as capital of “The Empire State” and the “capital of capitalism.” We’ll look closely at Five Points and “The Gangs of New York,” the Draft Riots, the era of Ellis Island and immigration, the culture of Irish New York, Yiddish New York, and Italian New York, at Greenwich Village when it really was bohemian, Black Harlem when it really was in vogue. We’ll focus on the artists, writers, musicians and architects who have given shape and expression to the city, spending time with such figures as Edith Wharton, Henry James, F. Scott Fitzgerald, Langston Hughes, and E. L. Doctorow. Two overnight field trips to New York City will be programmed into the course. The actual weekends will be posted soon for the overnight field trips.

CAPSTONE
The Capstone is designed to encourage the integration of course work in the program and comes at the end of a student’s MLA career. Students conclude the MLA degree by doing a portfolio, graduate project or internship. The student works with the Program Director to determine the option best suited to the student’s needs and goals.

MLA Portfolio
The Liberal Arts Portfolio is a non-credit option within the MLA Capstone. Students who select the Portfolio option will take 10 courses in the program. The portfolio will be completed within the same semester as the 10th course, and for students not selecting a graduate project or thesis, the portfolio is a degree requirement. The associate chair serves as the portfolio adviser. The portfolio consists of a sampling of the best papers and projects written over the course of the student’s graduate career. It is not simply a collection of papers but designed to help students see the intellectual point of convergence in their studies. It is also provides a travel log chronicling the student’s journey toward their own “way of knowing.”

MLA Graduate Project
The graduate project is part of the MLA capstone. You will need permission from the program director to register for this option. Most students enrolled in the Master of Liberal Arts program conclude their degree requirements by writing an independent project under the direction of a faculty sponsor. The graduate project is interdisciplinary in scope and reflects an emphasis or interest that the student has discovered in the MLA program. Before registering for the graduate project, a student must receive proposal approval from the faculty sponsor and the MLA Program Director.

Internship
The internship is part of the MLA capstone. Please contact the internship director for more information on internship options.
THE CENTER FOR LIBERAL ARTS IN ADVANCED ACADEMIC PROGRAMS

The Center for Liberal Arts (Center) provides a lively, intellectual space for students interested in a degree or those who want to learn more about the world and their own location in it. Courses, events and special symposia offer an immersion in the great ideas and thinkers, and a consideration of both the classic and the contemporary. Students of all ages and academic backgrounds come together to explore the social, cultural and humanistic dimensions and context of the world and their own individual lives. The Center includes the Master of Liberal Arts, the Odyssey Program, and the Osher Lifelong Learning Institute.

The Odyssey Program (celebrating 20 years) offers non-credit classes to working adults interested in the richness of the liberal arts. Go inside the palaces of King George IV, or study renowned artists and take a guided tour of their works at a local museum. Compare two of America's longest wars (Vietnam and Iraq) or take up your pen to begin that novel in a fiction writing class. Find the answer to the age-old question of, “Why does the Leaning Tower of Pisa actually lean?” The Odyssey Program also includes the Certificate on Aging and the Mini-Medical School.

The Osher Lifelong Learning Institute at JHU was created in 1986 to enhance the leisure time of active, semi-retired and retired individuals in the community. The institute builds on the assets of JHU to offer members intellectual growth, lively discussions, rewarding cultural experiences and new friendships. The institute classes explore the worlds of art, history, philosophy, literature, politics and science. Classes are offered in Baltimore, Columbia and Montgomery County, Maryland.
To prepare current and future museum professionals to be the visionary leaders of museums in contemporary society, Johns Hopkins University (JHU) offers an innovative Master of Arts in Museum Studies. The format of the program itself—an almost fully online program—looks to the future. As an online program, we are able to offer the expertise of highly regarded professors and museum professionals from around the world, innovative virtual field trips, and global resources from a wide array of museums brought together in new and exciting ways. An international student body provides diverse perspectives and experiences in a dynamic online learning environment.

Museums of the 21st century are in the midst of a tremendous period of growth and change. New demands and challenges are emerging in every aspect of the museum landscape. Innovations in information and communication technologies are being integrated into the core strategies of the museum. Museums are increasing in number, expanding in size, and attracting more diverse audiences every day. The museums of the 21st century need leaders with the knowledge and skills to face these challenges and who possess a vision for the future.

The aim of this program is to provide a perspective on the theory and practice of museums in a changing technological, social and political environment for current and future museum professionals. It emphasizes the role of technology as a pervasive aspect in today’s museum, examines new models of education, exhibition, and business strategies, and explores the role of the museum in a global society and as an agent of social change.

We welcome students interested in all types of museums including history, technology, science, art, special topic or themed museums, historic sites, national parks and zoos, and those interested in collections and exhibitions for corporations, government agencies, and private organizations.

**DEGREE REQUIREMENTS**

All students earn a Master of Arts (MA) in Museum Studies. Nine online classes and one onsite seminar are required to complete the degree. These 10 courses are made up of two required courses, three core courses, and five electives, which must be completed within five years of beginning the graduate program.

**Online Classes**

All online classes are offered as asynchronous learning experiences, allowing maximum flexibility in a student’s schedule. Students can log on to an easy-to-use course management system at anytime, from anywhere, 24 hours a day, and 7 days a week. Courses are structured around weekly course content and students log on multiple times a week at their convenience to access course materials, participate in discussion, submit assignments, or take exams. Course content is delivered mainly via text, multimedia presentations, and threaded discussions. As an online program, we use the Internet to its full potential, and learning is enhanced through the most up-to-date web-based tools for design, collaboration, conferencing, and community building. Classes are kept small (15-17 students) to encourage active engagement and community among fellow students and students and faculty. Students have direct access to faculty in their courses and can arrange one-on-one student/faculty online meetings in real-time.

To address student concerns or questions about an online learning environment, an orientation course, offered by the university, introduces the student to the online learning tools, and is required before taking the first online class.
Onsite Seminar
A two-week intensive period of on-ground museum study in Washington, DC, or in another location organized by the Museum Studies Program is a required component of the program. The seminar includes practicum opportunities in a variety of museum settings; conversations with local museum professionals; observation of and interaction with museum visitors; and class sessions to integrate the daily experiences. Using the rich diversity of museums in the Washington area or an equally suitable site, this course provides students with the chance to use what they have learned in their prior courses, develop networks with fellow students and museum experts, and explore the latest in museum practice, including exhibition design and development, public programming, collections management, conservation, and the uses of technology in the museum. Students work in teams on directed activities during the two-week period. Note: Students must have completed a minimum of two courses in the program, one of which must be 460.601 or 460.602, to register for this class. Some seminars may have other specific requirements. Students are responsible for travel to and from the location, accommodations and meals, as well as any specified field trip fees.

Waiver option: Students who are unable to travel to Washington, DC, or to other seminar locations, due to accommodation needs, financial hardship, or family challenges, may apply to the program director for an exemption to the two-week seminar.

If a waiver is granted, the student must enroll in the internship option (460.750) to fulfill the onsite component of the degree requirement.

COMMUNITY

Students
Students in the Museum Studies Program include current and aspiring museum professionals from around the world. We have students from a variety of academic and professional backgrounds, including those with degrees in areas such as art history, anthropology, history, economics, business administration, historic preservation, biology, archeology, music, philosophy, and film and media arts.

Faculty
The Museum Studies faculty is made up of highly regarded experts in the museum field and academia from diverse geographic locations. The faculty is primarily full time museum practitioners, who are active members of the museum community. They are passionate about training the next generation of museum professionals and enthusiastic about the online course format.

Advisors
All Museum Studies students are assigned an advisor who will help determine which courses are best for their career goals.

Alumni
Alumni from the program hold positions such as museum director, curator of collections, exhibition coordinator, registrar, director of education and public programs, visitor services manager, and social media coordinator. The program maintains close ties with our alumni and they serve as ambassadors to new students.

Network
As an online program, we offer students valuable opportunities to meet museum professionals from around the world. We build a community within the program through social media tools and a virtual museum café, where students meet others in the program, find internship and job announcements, and learn about relevant conferences and events.

ADMISSION REQUIREMENTS

> A grade point average of at least 3.0 on a 4.0 scale
For students who have been out of school for some time, museum work experience—employee, intern, or volunteer—may also be considered.

> Strong writing skills

Application Documents
> AAP application and fee.
> A current résumé or CV.
> Two letters of recommendation that verify professional and/ or academic accomplishments.
> A statement of purpose (approximately 750 words). This statement should describe how your academic and professional experiences have led to your decision to pursue a career in the museum field, and how this Museum Studies degree will help you succeed in your goals in the museum profession. If you have worked for a museum in any capacity, please incorporate your experience into your statement. Your statement will be reviewed for content, organization, and writing style.
> Official undergraduate and graduate transcripts from all institutions attended.
> International students must submit TOEFL scores and a “course-by-course” credential evaluation of their undergraduate transcript performed by an outside evaluation service.
> All students who earned their post-secondary degree(s) in a country other than the United States must submit a “course-by-course” credential evaluation performed by an outside evaluation service.

CURRICULUM

The Museum Studies Program offers a structured curriculum of required and core courses augmented with electives. This
The program encompasses both theory and practice, focusing on providing real-world skills and training that enable students to move into the museum field or advance into jobs with more responsibility.

Students must take a total of 10 courses

- Exploring Museum Professions (460.601) OR Museums in the Digital Age (460.602)
- Three core courses
- Onsite two-week seminar (460.610)
- Five elective courses

An internship at a student’s local museum, approved by the internship coordinator, may be substituted for one elective course. Students may take up to two courses in other JHU departments as electives, subject to the approval of the program director.

Note: Students may not earn a C in a core course or required course. If you earn a C in a core or required course, you must either repeat the course or take another core or required course to count towards your degree. Degree candidates who receive a second C or below in either a repeated core course or any course taken in the program will be dismissed from the program.

REQUIRED COURSES

- Students are required to take either 460.601 or 460.602;
- And 460.610

460.601 Exploring Museum Professions
Managing today’s museum relies upon the coordinated efforts of a wide range of specially-skilled staff. From directors to accountants, curators to educators, exhibit designers to event planners, registrars to conservators, IT to media, marketing to membership, security to facilities—the professionals behind a museum’s walls define the quality of the institution and each visitor’s experience. Through readings and audio interviews with leaders in the museum field, this course examines the core functions of the museum and how the roles and responsibilities of museum professionals assure a museum’s daily operation, growth and sustainability. Current issues facing museums, including financial challenges and the effects of technology will also be explored. Note: This course may be taken as an elective, if you have taken 460.602 to meet the requirement.

460.602 Museums in the Digital Age
With the emergence of new media and the ever-expanding use of the Internet, the traditional role and scope of the museum is changing. The museum has a new position in global communication, dissemination of information and cultural understanding. The introduction of technology into the museum is challenging traditional exhibition concepts, introducing new interactions with museum audiences, and affecting the museum’s core operations. This course introduces students to the museum field and explores the impact of media and technology on the museum, including an overview of the historical role of the museum in society and an examination of the current uses and effects of digitization, the Internet, and wireless technologies in these institutions, as well as basic concepts underlying the planning of a technology project for a museum. (460.660 may be taken in place of this course as a required course.) Note: This course may be taken as an elective, if you have taken 460.601 to meet the requirement.

460.610 Two-Week Onsite Seminar
A two-week intensive period of on-ground museum study in Washington, DC, or in another location organized by the Museum Studies program is a required component of the degree. The seminar includes practicum opportunities in a variety of museum settings; conversations with local museum professionals; observation of and interaction with museum visitors; and class sessions to integrate the daily experiences. Using the rich diversity of museums in the Washington area or an equally suitable site, this course provides students with the chance to use what they have learned in their prior courses, develop networks with fellow students and museum experts, and explore the latest in museum practice, including exhibition design and development, public programming, collections management, conservation, and uses of technology in the museum. Students work in teams on directed activities during the two-week period.

Note: Students must have completed a minimum of two courses in the program, one of which must be 460.601 or 460.602, to register for this class. Some seminars may have other specific requirements. Students are responsible for travel to and from the location, accommodations and meals, as well as any specified field trip fees.

Waiver option: Students who are unable to travel to Washington, DC, or to other seminar locations, due to accommodation needs, financial hardship, or family challenges, may apply to the program director for an exemption to the two-week seminar. If a waiver is granted, the student must enroll in the internship option (460.750) to fulfill the onsite component of the degree requirement.

CORE COURSES

Choose three out of five

460.604 Introduction to Museum Education
This course introduces students to the educational role of the museum. What benefits and services does museum education provide in a pluralistic society? What do educators do within the museum organization? We begin by tracing the history of education in museums. We review theories about how people learn, what constitutes good teaching practice in the museum, and the unique role that objects play in an informal learning environment. We look at the different kinds of audiences for education programs, how to develop museum experiences including effective education programs and services, how
evaluation works in gathering feedback and assessing outcomes in a museum setting, and the role of educators in inter- and intra-museum collaborative projects such as the development of exhibition interpretation, marketing for educational programs, audience building and interpretive planning. This course also considers the role and integration of digital technologies in the provision of educational services, products and programs.

460.606 Exhibition Strategies
This course introduces the diverse strategies and approaches used in exhibition planning, development and implementation. It asks students to think critically about exhibitions and the interface between objects, concept and experience. The course focuses on visitor-centered interpretive design and is applicable to a wide range of institutions. Students spend much of the semester working together in small teams, collaboratively producing a comprehensive exhibition project as they walk through the practical steps in exhibition development and design. Note: Because of the high level of online group work, this course is not recommended for first semester students.

460.608 The Business of Museums
Museums are stewards of cultural heritage and intellectual property, vortices of knowledge, and arbiters of taste. They are community icons, places of respite, and public education adjuncts. Museums don’t necessarily deal in products for profit, yet they compete in an entertainment ecology. They must cultivate members, donors, government funds and corporate contributions, and rely on programs, gifts, grants, sponsorships, retail operations, and planned giving to survive. They must advocate for themselves in the legislative arena, while constricted by their nonprofit status. Students will become conversant in the fundamentals of museum business including mission, nonprofit status, transparency, governance, programming, management, finance, fundraising, facilities, legal and ethics issues, the impact of technologies, and everchanging audiences. They will achieve this through readings, thought-provoking essays, engaging discussions, museum news analysis, recorded public talks, and live online discussions with leading museum professionals.

460.609 Museums in a Global Perspective
In this intensive course, students participate in collaborative role-play to debate urgent issues confronting museums in the 21st century. Through readings, research and extensive teamwork, students explore, analyze, develop, and discuss a range of policies and procedures that link museums to international communities and trends. Students examine and experience (through simulation) the significant effects and challenges of a globalizing world on museum mission, preservation of cultural heritage, and exhibition practice. Students gain experience in debating global issues that will have an impact on the future of museums as well as developing and writing effective program proposals. The collaborative aspect of this course requires the flexibility to schedule working sessions every other week with an assigned team. Note: Students must have completed two courses in the program to register for this course.

460.666 Collection Management
Museums exist to preserve and share their collections with the world. Collection managers, or registrars, are essential to any collecting institution, whether collections are art, history, science, or live specimens. This course focuses on management principles that can be applied broadly to any type of collection. The course covers all aspects of collections care from the acquisition of objects, evaluation, care and storage, through loans and exhibitions. Safe collections care and handling, using the most current methods, are emphasized so objects may be preserved for future generations. Any student who intends to work at a collecting institution will benefit from mastering the practical knowledge and skills underpinning many phases of museum work, which will be taught in this class.

ELECTIVES
Choose five of the following

460.611 History & Philosophy of Museums
From cabinets of curiosities to historical monuments and sites of memory, this course surveys museum history from a global perspective to examine how the museum’s function has changed over time. Students create a comprehensive timeline of museum history and philosophy—thinking through and visualizing the way certain concepts and events are related in time and across space. Through case studies and course readings in museum history, theory and methods, students will contextualize the philosophical trends that have impacted organizational structures, outreach, collection strategies, and the museum’s role and relationship to its public.

460.612 Multimedia History, Theory, and Practice
This course is an overview of the artists, scientists, philosophers, mathematicians, and engineers who have pioneered the scientific and artistic concepts central to our understanding of multimedia. It emphasizes a critical understanding of the crossdisciplinary nature of art, science and technology, crucial to the effective incorporation of new media aesthetics, production strategies, trends, and socio-cultural experiences into the museum environment. Seminal 20th-century interdisciplinary artistic movements and genres will be explored, i.e. kinetic sculpture, installation art, electronic theater, etc., to consider their interplay with the evolution of personal computing including: cybernetics, augmented intelligence, hypertext, graphical user interface, etc. Students will critique museum installations, online projects and educational exhibits, applying concepts learned in the course, to better understand how digital multimedia has come to define our contemporary museum experience.

460.614 Ethnically Specific Museums
This course examines the history, significance, and potential of ethnically specific museums to enliven the debate about who we are as a nation through our shared experiences and heritages. Students look at six diverse museums including the National Museum of the American Indian, the Japanese American National Museum, el MUSEO del barrio, the Arab American National Museum, the Jewish Museum, and the National Museum of African American History and Culture.
460.615  Museums and Community Engagement
This course explores how museums and cultural organizations of all sizes can strengthen their relationships with the communities they serve. No longer are museums measured and judged solely by their internal resources—collections, endowments, facilities, and staff—but rather by the external benefits and value they create for individuals and communities. Growing numbers of museums are learning to make their organizations more meaningful and relevant by involving their communities in ongoing planning and decision-making. They are reframing museum activities to focus on what matters to their communities. By getting involved in community challenges and developing new partnerships, they are identifying underserved audiences and creating memorable visitor experiences. As museums begin this journey towards community engagement, they are initiating and facilitating social change and moving towards social entrepreneurship. This course includes the theory and skills of community engagement, drawing on both research and practice for examples.

460.616  Museums, Law, and Policy
Legal issues and concepts are a fundamental part of the day-to-day management of museums and the policies that shape the nature of museums. This course introduces students to the ways in which museums are affected by the law and key legal concepts. Discussions and assignments will address practical concerns as well as policy and conceptual matters, incorporated cases, mock negotiations, and group discussions. Students will be able to identify issues from hypotheticals and relevant legal concerns and resources. The course will help students understand legal matters in museum practice in an applied manner. Legal and policy discussions will include current issues in copyright, freedom of speech and censorship matters, and collections issues including cultural heritage developments.

460.617  Ethics, Technology, and the Museum Professional
This course explores the broad range of ethical issues in the 21st-century museum as related to new technologies including how current theories of business ethics can be applied to the museum, how to critically evaluate new technologies before adoption, and how and when to establish ethics policies.

460.618  Museum Controversies: Ethical Issues in Museums
Museum directors, curators, and other staffers have faced an array of political and ethical dilemmas in an increasingly contentious environment. This course explores the historical, political, and cultural backgrounds to controversies surrounding exhibitions such as the Smithsonian’s display of the Enola Gay, the Brooklyn Museum of Art’s “Sensation,” the British Museum’s Elgin Marbles, and the showing of illegally acquired antiquities at various art museums. Nationalism, religious beliefs, obscenity, and “edutainment” are among the issues discussed.

460.620  Accessibility in the Museum
Making museums and their information and collections accessible to people with disabilities concerns more than ramps and restrooms. People with disabilities can encounter barriers to every aspect of the museum experience, from finding out about exhibitions and educational offerings before a visit through advertising or the museum’s website; to getting to, into and around the museum galleries and other public spaces; to hearing tours and lectures, reading labels and signs, and using interactive tools; to participating in educational programs. This course will introduce students to the key concepts and issues associated with making museums accessible to and inclusive of people with disabilities.

460.621  Evaluation Theory & Techniques for Museums
This course covers evaluation theory, methodologies, and practical implementation of evaluation in museums and similar environments. The class explores the stages of evaluation, what can be achieved at each stage, and how those stages fit into educational technology development. Students practice developing clear evaluation questions, choosing appropriate methods, and assessing the benefits and trade-offs of different evaluation strategies. Emphasis is given to the opportunities and challenges of evaluating all types of museum experiences (programs, exhibitions, architecture, wayfinding systems, various interpretive technology, etc.) from multiple points of view, including museum visitors and museum staff.

460.628  Architecture of Museums
This course serves as an introduction to museum architecture, including the history of museum buildings, as well as current case studies of renovations, expansions and new facilities. We will discuss the relevant topics in creating a physical museum space, such as developing a museum program, planning the visitor experience, developing wayfinding systems, building a green museum, and incorporating technology in the initial plan. We will analyze museum buildings from multiple perspectives, including visitors, staff and collections. Students will learn how to evaluate an existing museum building and will be guided through a mini-POE (post-occupancy evaluation) of a museum in their community.

460.630  Exhibition Design, Construction, and Documentation
Understanding the exhibition design process, from concept to implementation, is valuable not just for exhibition developers, but also for registrars, curators and museum educators. Looking beyond artifacts, storyline and aesthetics, this course examines the rarely explored, but essential, aspects of exhibition design, from drawings and specifications to contracting and installation. Topics will include drawing packages and project documentation, schedules, client and developer responsibilities, project budget, architectural coordination, fabrication techniques, and legal and practical contracting considerations. As with general construction, the exhibition designers and fabricators follow industry standards, and whether a museum is a public or private organization, specific rules must be followed for solicitation and contracting. Prerequisite: Exhibition Strategies (460.606)

460.633  Core Aspects of Conservation: A 21st Century Approach
The conservation, preservation, and restoration of cultural
heritage is an increasingly complex practice within the museum context, and one that benefits greatly from widely-shared knowledge and collaborative networks. Today a variety of highly-specialized conservators perform treatments on individual items of high value, while at the same time there are a growing amount of conservation-related issues that collections managers, registrars, and others are responsible for in the process of caring for collections. This class will give students the opportunity to work in and around conservation issues and tasks, while assimilating and contributing to the existing body of knowledge in collections care (preventive conservation). A variety of media used to create and conserve artworks will be discussed. Assignments will be coordinated with or related to current web-based conservation projects, including Wikipedia, ConservationReel, and AIC’s Lexicon Project. Prerequisite: Collection Management (460.666)

460.634  Museums, Libraries, and Archives: Issues of Convergence for Collecting Institutions
“Convergence” has been a buzzword for archives, museums, and libraries for most of the past decade. This course will look at areas of convergence among the three communities, focusing on issues that relate specifically to collecting institutions. Class work will involve the history of collecting and the development of the three communities (archives, libraries and museums) in the United States in the late 19th century/early 20th century, before delving more deeply into ideas and ideals, missions, professional training, conservation, ethics, and services that are shared among these communities. In the final weeks we will focus on how technology can help shape ongoing dialogues.

460.635  Curatorship: Principles and Practices
Whether the museum is large or small, public or private, it has several curatorial departments or a single director/curator, but must have a way to fulfill its curatorial obligations. Everyone in the museum should understand the institution’s curatorial responsibilities, and every museum should have a curatorial strategy suited to its collection and/or its exhibitions. In this course, students will study principles and practices relating to core curatorial functions and learn about the relationship of curatorship to the museum’s mission, ethical and other challenges facing museums, and how technology is changing the ways museums fulfill their curatorial responsibilities. Students will draft a position description for today’s curator, write an acquisition proposal, present an exhibition proposal, and visit museums to critique specific curatorial practices.

460.636  Living Collections
Zoos, aquariums, botanical gardens, and nature preserves, like many other museums, are collection-based institutions. This course explores the unique character of these institutions in their core functional areas including the special considerations and challenges of caring for, interpreting, and exhibiting living collections. Developed by three museum professionals with specialties in terrestrial, aquatic, and botanic institutions—course topics are explored through the lenses unique to plants, animals, and marine life. In addition to understanding the core functional areas of these museums students will analyze the complex social role of cultural institutions which are devoted to the living world.

460.639  Material Culture and the Modern Museum
From the Mona Lisa to Archie Bunker’s easy chair, museums play a critical role in the collection, preservation, and interpretation of objects. This course looks closely at the development of material culture studies and its connection to museums in the 21st century. Students will explore collecting as meaningful action, the classification of objects (from academic categorizations to tags and folksonomies) and their access (from collections to archives, to physical and virtual display). Student-developed object biographies will be used throughout the semester to explore the life history of objects, their changing meanings, and their relationship to self, society, and the museum. Note: Students are strongly encouraged to have completed two courses in the program before registering for this course.

460.640  Educational Programming for Museum Audiences
Educational programming for today’s museums requires more skills than ever before, from defining mission-driven educational goals to conducting summative evaluation, from understanding learning theory and characteristics of a myriad of museum audiences, to designing and implementing technology solutions. Students in this course will learn the steps needed to design sound educational programming in museums, including developmentally appropriate learning theory and strategies for audiences such as children, families, adults, teachers, and students. Prerequisite: Introduction to Museum Education (460.604)

460.641  Digital Media in the Museum
Technology has become a core tool for interpretive and information programming in most museums today. From handheld devices to interactive tables, Imax to object theater, interactive media is being used to market, navigate, interpret, simulate, and above all, stimulate a growing number of museum visitors. Through presentations, interviews, hands-on experience, and even a behind-the-scenes tour, this course explores the wide range of technology options available today and in the near future. Beyond possibilities, the course provides the students with the basic skills to select the best solution and to plan, manage, and assess the production of successful in museum media projects. Students will have the opportunity to produce a small media prototype or develop a proposal for a real or imagined production.

460.642  Creating Online Learning Environments for Museums
This course will address how to develop collection materials into effective online learning environments. Through readings, discussion and hands-on experimentation, students learn how low-cost, web-based tools (such as blogs, wikis, and other content creation applications found in public websites like Google) can be used to create informal and formal learning experiences that mirror or expand onsite museum learning experiences. Social networking and media distribution sites (such as Facebook and Flickr) will also be examined for educational potential in a museum context. The class will culminate in a final team project to create an educational website proposal for an actual museum. Note: Students are
opportunities that the internet, mobile technologies and social
collections information and digital assets, to understanding the
from supporting core museum functions like managing
understanding of the impact and opportunities that can be
museum professional today, in any discipline, requires some
information and engage with their audiences. To be a successful
Museums
writing, annual and capital campaigns, corporate giving and
strategies and ethics, ePhilanthropy, prospect research, grant
case studies, discussions, and written assignments based on
throughout the world will be presented and discussed.
crisis communications and social media. Creative and strategic
resources. Topics range from market research and branding to
of increasing competition for people's time, attention, and
roles of museum marketing and communications in an era
This course explor
Communications
fundraising, collaboration, and marketing projects. The bulk
of the coursework will focus on researching and creating
the components of a Web project plan (for a project of the student's
own choice and design). Students will gain hands-on experience
with audience research and usability testing, articulating
technology solutions to match desired goals, developing
information architecture, building a basic online prototype,
crafting a marketing and evaluation plan, and pitching a
project idea for funding. A range of online technologies will be
considered including websites, blogs, email newsletters, mobile
applications, and social media.

460.662 Developing Museum Web Projects
How can museums best use the web to further their missions?
What are the best practices for planning and sustaining
high-quality online projects? In this course, students will
survey the application of online technologies for various
purposes, including collections, education, exhibition,
fundraising, collaboration, and marketing projects. The bulk
of the course will focus on researching and creating
the components of a Web project plan (for a project of the student's
own choice and design). Students will gain hands-on experience
with audience research and usability testing, articulating
technology solutions to match desired goals, developing
information architecture, building a basic online prototype,
crafting a marketing and evaluation plan, and pitching a
project idea for funding. A range of online technologies will be
considered including websites, blogs, email newsletters, mobile
applications, and social media.

460.604 - Museums in the Digital Age.
strongly encouraged to take Introduction to Museum Education (460.604) before enrolling in this course.

460.650 Fundamentals of Writing
Excellent writing skills are an essential element of every
museum professional's position. This course is designed to
help students improve their writing and communicate their
ideas more effectively. Through weekly writing assignments
gear to the museum profession, students will work to convey
their ideas clearly, concisely, and effectively. Students will
practice narrative, explanatory, and persuasive writing, with an
emphasis on appropriate style, usage, and composition. Topics
will include planning and organization; appropriate tone, voice,
and audience; developing and supporting a thesis; and proper
documentation and presentation. Course assignments will
culminate in a short research paper and presentation based on a
current museum topic.

460.652 The Practice of Museum Publishing
As content originators, museum curators, educators, conservators, public relations officers, development staff, and
others will hold a stake in the publications process at some
point in their careers. This course presents an overview of the
range of print and electronic publications typical—and not so
typical—of museums and the processes required to make them
happen. Students will gain an understanding of schedules and
budgets, the editorial process, design concepts, copyright issues
and printing, as well as how new technologies have affected
both the way museums think about publications and how they
get produced.

460.655 Expanding Roles of Museum Marketing and
Communications
This course explores the core responsibilities and the expanding
roles of museum marketing and communications in an era
of increasing competition for people's time, attention, and
resources. Topics range from market research and branding to
crisis communications and social media. Creative and strategic
thinking and collaboration will be emphasized, and models from
throughout the world will be presented and discussed.

460.657 Fundamentals of Museum Fundraising
Through a combination of current and historical readings,
case studies, discussions, and written assignments based on
“real-life” scenarios, this course will cover general fundraising
strategies and ethics, ePhilanthropy, prospect research, grant
writing, annual and capital campaigns, corporate giving and
cause marketing, special events and stewardship.

460.660 Culture and Management of Technology in
Museums
Technology plays an increasingly critical role in how 21st
century museums should operate their business, manage their
information and engage with their audiences. To be a successful
museum professional today, in any discipline, requires some
understanding of the impact and opportunities that can be
derived from the use of technology to support our initiatives,
from supporting core museum functions like managing
collections information and digital assets, to understanding the
opportunities that the internet, mobile technologies and social
media can provide to engage with our audiences. Understanding
the principles that underlie various technologies and specific
applications, and how the workplace and society influence our
use of technology are crucial to understanding how museums
can use technology to deliver on their missions. By providing
a grounding in technology trends, principles, concepts,
applications and philosophies, this course will provide non-
technical students with the necessary knowledge and tools to
assess, deploy and manage the use of technology in a museum
environment. This course may be taken as a required course in
place of 460.602 - Museums in the Digital Age.

460.662 Developing Museum Web Projects
How can museums best use the web to further their missions?
What are the best practices for planning and sustaining
high-quality online projects? In this course, students will
survey the application of online technologies for various
purposes, including collections, education, exhibition,
fundraising, collaboration, and marketing projects. The bulk
of the coursework will focus on researching and creating
the components of a Web project plan (for a project of the student's
own choice and design). Students will gain hands-on experience
with audience research and usability testing, articulating
technology solutions to match desired goals, developing
information architecture, building a basic online prototype,
crafting a marketing and evaluation plan, and pitching a
project idea for funding. A range of online technologies will be
considered including websites, blogs, email newsletters, mobile
applications, and social media.

460.667 Collections Information Management Systems
Collections Management Systems, the workhorses of museum
information technology, long ago evolved into Collections
Information Systems, able to provide staff members and the
public with access to collections information for a myriad
of purposes. So why is it that despite this vastly increased
functionality, so many museums use these complex and costly
systems to carry out the same restricted set of tasks they
performed in their earliest incarnations? Why is it that, even
while these systems can serve as powerful tools for educators,
curators and museum visitors, they are frequently neglected
or updatable only by the registrar's office? As information
about the objects in our collections has become a valuable and
widely accessible asset, it is used more widely and intensively
than ever before. Yet in many institutions, the effort to produce
this information is duplicated among multiple departments,
drawing on multiple data management technologies and
unsynchronized sets of data. In this course, we examine the
purposes for which collection information is used, who takes
responsibility for it, and how it is managed. Students will learn
to evaluate the object information needs of the museum by
examining who uses object information, regardless of where
and how it is stored, and to what end. Practical exercises in
requirements identification, "corralling" legacy data into
consistent formats for import to standards-based systems,
selecting appropriate standards, and developing criteria for
selecting not only the right system but the right kind of system
(or systems) will prepare students for the real world of messy,
inconsistent, and often "siloed" information.
460.668 Cataloging Museum Collections: History, Standards, and Applications
Cultural heritage institutions—including museums, libraries, and archives—have as core responsibilities the safeguarding of the objects in their care and the education of the public about these objects. To support both of these responsibilities, one of the foundational activities of cultural heritage professionals is the cataloging of the objects in their collections. This course will provide both an overview and practice of cataloging definitions, philosophies, standards, and practices. Recordkeeping methods, numbering systems and data formats will be emphasized, and professionally accepted standards for cataloging various cultural objects will be reviewed. Discussion of the broad application of cataloging data sets, including cross collection aggregation and search, delivery to the public, and Web 2.0 and 3.0 delivery methods will be covered.

460.670 Digital Preservation
This course introduces students to the current state of digital preservation, preservation challenges, and basic concepts for designing effective digital preservation plans and programs. Topics include the relevance of digital preservation for museums; archival principles that inform preservation practices; standards and policies; considerations in preservation strategies; issues relating to formats, repositories, and processes; and emerging preservation solutions and services. Prerequisite for students enrolled in the MA in Museum Studies: Collection Management. Prerequisite for students enrolled in the MA in Museum Studies: Collection Management (460.666)

460.671 Foundations of Digital Curation
This course lays a foundation for managing digital information throughout its lifecycle by introducing students to the emerging field of digital curation and by examining the practical issues and tools involved in managing digital collections and repositories over time. Topics include appraisal and selection; principles of records management; resource description; systems design; management of research data; policy issues, and user services. Prerequisite for students enrolled in the MA in Museum Studies: Collection Management (460.666)

460.672 Managing Digital Information in Museums
This course addresses technical and practical issues involved in the long-term management and preservation of digital assets, with an emphasis on the unique problems facing museums. Subjects will include the best practices for digital format conversion, the management of digital surrogates and derivatives, practical planning and design of workflow for digital curation, and a survey of the technologies (software, equipment and metadata schemas) required at ingest, storage, access, and dissemination points in the Open Archival Information System Model. These topics will be presented within the context of analyzing the digital asset management practices in the broadest sense of individual institutions, and developing strategies for the curation of these assets. Prerequisite: either Digital Preservation OR Foundations of Digital Curation; both are recommended.

460.673 Digital Curation Certificate Internship
The internship, including at least 120 hours of field experience, affords students the opportunity to gain hands-on experience working with experts who are leading digital curation activities in museums and related cultural heritage organizations in the U.S. and abroad. The internship is a partnership between the university and the host institution and is customized to meet each student’s needs and career goals. The program will assist students in arranging appropriate internships. Student interns will produce evidence of their accomplishments through work products, project reports, or other documentation in an online course component and will participate in online discussion forums with other students enrolled in digital curation internships during the same semester. The internship is taken after completing at least two of the following core courses: Digital Preservation, Foundations of Digital Curation, or Managing Digital Information in Museums.

460.674 Digital Curation Research Paper
The supervised research course enables students to investigate a significant problem or issue in digital curation and to develop and demonstrate critical thinking and communication skills. Ideally, the research paper will build on the student’s internship experience. The research paper is expected to result in a publishable or presentable paper that makes a contribution to the literature and field of digital curation. As there is currently a significant need for research in digital curation, and relatively little published literature -- especially relating to museums -- student research in this program can make a major contribution, and graduates will be prepared for careers as leaders in the field. Coursework, assignments, and meetings with a faculty member will take place in an online course environment. The research paper is normally completed as the final requirement in the certificate program.

460.675 Leadership of Museums
This course is for students who either are or aspire to become the executive director of a museum. This need not be an immediate goal, but students should have a strong sense that this is what they want to do eventually. This course is not simply about museum leadership. Rather it is designed to help students understand their respective leadership strengths and potential, and to identify skills and practices that they can use to become a successful museum director. There are many kinds of museums, and many types of leadership, and no single type fits all situations. We will explore the complexities of leadership in general, the specific challenges of leading a museum, and best practices among effective leaders. Students will reflect on and write about themselves as leaders, analyze and discuss cases of vexing leadership challenges, lead class discussions, interview museum directors about challenges they have faced, and describe their own plans for preparing to take on the job of museum executive director. Prerequisite: Students must have completed ONE of the following courses to register for this course: History & Philosophy of Museums (460.613); Museums, Finance and the Economy (460.684); or Fundamentals of Museum Fundraising (460.657)

460.682 Museum Procurement and Contracting
Through case studies and case law, sample materials from a variety of museum projects and a smattering of underpinning statutes and regulations, students will learn the hows and
whys of museum outsourcing practice. While conducting market research, drafting a scope of work, evaluating creatives and pricing approaches, and confronting ethical constraints, students will derive a practical road map for leveraging the marketplace to address museum needs. Students will learn best practices and acquire a deeper understanding of the contractual, legal, technical, and creative issues that museums typically face when working with vendors. Most importantly, students will acquire the tools necessary to help them navigate and set the expectations of their museum clients to assure successful collaboration between internal teams and external contractors.

460.684 Museums, Finance, and the Economy
This course examines how changes in the economy can affect museum income, expenditures, fundraising, endowments and attendance. It explores how various museum practices can mitigate the effects of a weak economy and capitalize on a strong economy. Through case studies of large and small museums, students examine information sources that managers use to identify changes in the local, regional, and national economy, which might affect their institutions. Students gain familiarity with economic and museum financial information by adopting two museums and tracking how changes in their finances and attendance relate to shifts in the economy. This course is critical for all students interested in the “behind-the-scenes” of museum management, including those with little or no background in finance or economics.

460.750 Museum Internship
An internship at a student’s local museum, approved by the internship coordinator, may be substituted for one elective course. To fulfill the internship requirement, a student must complete a minimum of 80 hours of work onsite and a project, (either a research paper or a practical product) on an approved topic related to his/her experience, due at the end of the semester. Students also participate in online discussion and course work during the semester. Before registering for the internship option, the student should contact the internship coordinator for approval. At least four to six weeks before the beginning of the semester in which the internship will take place, the student must submit: 1) a description of the internship weekly duties including activities and/or responsibilities; 2) learning objectives and goals; 3) why this experience should be part of the Museum Studies degree; and 4) a signed letter of commitment from the internship supervisor. Students must have completed a minimum of two courses in the program before registering for this internship.

460.755 Museum Projects
This course expands opportunities for practical experiences beyond the onsite seminar and internship elective. Offered as an online experience, this course will involve students in an actual museum or museum-related project. Students will work in collaborative teams facilitated by a JHU faculty member and engage with museum professionals outside of the program. The goal of the course will be to establish a prototype or complete a real-life project of value to the museum field while interacting with current museum professionals. Museum Projects will be offered on an occasional basis and will vary in topic. Different prerequisites will be set up each time the course is scheduled depending upon the specific project. In addition to weekly research, writing and asynchronous discussions in the course management system, students should expect to participate in five to seven real-time online meetings throughout the semester, dates of which will be determined by the Museum Project team in tandem with the project requirements and deadlines. Students must submit a Museum Project application form two weeks before registration begins to be approved for enrollment in the Museum Project course. On this form, students will describe their interest in the specific Museum Project offered and other applicable topics as requested, as well as confirm their ability to attend five to seven real-time sessions. A selection committee will review the applications and determine enrollment eligibility before the semester’s registration begins. Enrollment limits may vary depending upon the project.

MA IN MUSEUM STUDIES/ CERTIFICATE IN NONPROFIT MANAGEMENT

Students pursuing an MA in Museum Studies, who are interested in furthering their management education, may enroll in the combined degree program offered with the Graduate Certificate in Nonprofit Management of Advanced Academic Programs. Museum Studies students may earn the Certificate in Nonprofit Management by taking an additional four of the six online courses necessary to complete the certificate, provided they have taken 460.608 The Business of Museums as a core course and have had at least one of the Museum Studies electives listed below. This enables students to earn both the MA degree and a Graduate Certificate for a total of 14 courses, 10 in Museum Studies and 4 in Nonprofit Management. Those interested, including current students, apply to the combined MA in Museum Studies/Graduate Certificate in Nonprofit Management through Advanced Academic Programs.

Students pursuing an MA in Museum Studies, who are interested in furthering their management education, may enroll in the combined degree program offered with the Graduate Certificate in Nonprofit Management of Advanced Academic Programs. Museum Studies students may earn the Certificate in Nonprofit Management by taking an additional four of the six online courses necessary to complete the certificate, provided they have taken 460.608 The Business of Museums as a core course and have had at least one of the Museum Studies electives listed below. This enables students to earn both the MA degree and a Graduate Certificate for a total of 14 courses, 10 in Museum Studies and 4 in Nonprofit Management. Those interested, including current students, apply to the combined MA in Museum Studies/Graduate Certificate in Nonprofit Management through Advanced Academic Programs.

MA IN MUSEUM STUDIES

Courses from the MA in Museum Studies

Ten courses from the MA in Museum Studies program are required. Of those 10 courses, the following apply:

Required
460.608 Business of Museums

Additionally, one of the following electives
460.621 Evaluation Theory and Techniques for Museums
460.655 Expanding Roles of Museum Marketing and Communications
460.657 Fundamentals of Museum Fundraising
460.660 Culture and Management of Technology in Museums
460.675 Leadership of Museums
460.682 Museum Procurement and Contracting
460.684 Museums, Finance, and the Economy
Courses from the Nonprofit Management Certificate

*Choose four of the following*

- 470.623 Nonprofit Program Development and Evaluation
- 470.625 Resource Development and Marketing in Nonprofits
- 470.728 Influence and Impact of Nonprofits
- 470.736 Principles of Nonprofit Management
- 470.774 Nonprofit Governance and Executive Leadership
- 470.798 Financial Management and Analysis in Nonprofits

MA IN MUSEUM STUDIES / CERTIFICATE IN DIGITAL CURATION

Students who are interested in pursuing both the MA in Museum Studies and the Digital Curation Certificate may apply to both programs simultaneously. Two core courses for the certificate may be taken as electives in the MA program and counted toward both the MA and the certificate, and vice versa, resulting in a total of 14 courses rather than 16. Students currently enrolled in either program may also apply to the other program at any time.

Applicants to the combined program should follow the admissions requirements for the MA in Museum Studies and submit a statement of purpose that describes in detail your academic and professional experiences that have led to your decision to pursue a MA degree in museum studies with a focus on digital curation.
Museums worldwide are now routinely digitizing all collection objects as they are acquired and loaned, not only for access but as documentation in the event of loss, damage or theft. They are also digitizing significant portions or even all of their holdings in order to create the robust web sites that the public now expects. In addition, museums are acquiring born-digital content such as digital media art, historical data in digital formats, and scientific research data. The creation and acquisition of valuable digital assets continues at a rapid pace, and cultural heritage institutions now have a critical need for professionals in the field to manage and preserve all types of digital assets to ensure their long-term availability for researchers, educators and the public, and to participate in the development and promotion of standards and best practices for digital curation in cultural heritage.

The Johns Hopkins University Graduate Certificate in Digital Curation, offered through the graduate program in Museum Studies, advances the education and training of museum and other cultural heritage professionals worldwide in this emerging field. The certificate program offers a specialized curriculum that prepares current and aspiring cultural heritage professionals to work with digital collections, exhibitions, and research data to ensure the effective stewardship of our global cultural heritage in all types of museums, from art museums to zoos, and related cultural heritage organizations. Students in this program will also contribute to the critically needed professional literature in the field.

The program prepares students to:

> Identify and describe the principles of digital preservation and digital curation
> Create and assess digital preservation plans and strategies
> Demonstrate understanding of archival principles of appraisal and the management of digital content in trustworthy repositories
> Demonstrate awareness of legal issues that impact museums’ abilities to preserve digital content and make it accessible
> Identify and describe workflows for the creation and management of digital content in museum environments
> Demonstrate understanding of research methods and critical thinking skills through the supervised research paper

ADMISSION REQUIREMENTS

Prerequisites:

Applications to the Certificate in Digital Curation will be accepted from:

> Individuals with a bachelor’s degree and at least 5 years experience working in a museum, library, or archive, or related cultural heritage organization
> Individuals with a master’s degree in Museum Studies or other relevant field
> Students currently enrolled in the JHU Museum Studies master’s program.
> A grade point average of at least 3.0 GPA on a 4.0 scale (work experience will also be considered)

Application Requirements:

> AAP Application
> Nonrefundable Application Fee: $75
> A current résumé
> A statement of purpose (approx. 750 words) that describes in detail your academic and professional experiences that have led to your decision to pursue a certificate in digital curation.
> Two letters of recommendation that verify professional and/or academic accomplishment.
> Official transcripts from all undergraduate and graduate coursework completed within the US only. (We accept official transcripts sent electronically through Scrip-Safe or Docufide, or in sealed institutional envelopes.)
> Course-by-course credential evaluation for all coursework completed outside the US. Study abroad may be exempt. Please contact the Admissions Office for guidance.
TOEFL for international students who have not graduated from an accredited college or university in the US and whose native language is not English.

**CURRICULUM**

Students must take a total of six courses to complete the certificate requirements: five core courses and one elective. Two of the three core courses marked with asterisks must be taken before enrolling in the internship or research paper requirements. The elective may be taken at any time.

Up to two courses completed in the JHU Museum Studies master's degree program may be applied toward the certificate upon admission to the certificate program. This includes two courses marked with asterisks below, or one of these courses plus an elective.

Also, up to two courses from the Digital Curation Certificate program marked with asterisks may be applied to the JHU Museum Studies master's degree program as electives.

**CORE COURSES**

- 460.670 Digital Preservation*
- 460.671 Foundations of Digital Curation*
- 460.672 Managing Digital Information*
- 460.673 Digital Curation Certificate Internship
- 460.674 Digital Curation Research Paper

**ELECTIVE COURSES**

Students may choose any of the MA courses to meet the Digital Curation elective requirement, but they are encouraged to discuss their choice and its relevance to their career goals with the Digital Curation Program Coordinator prior to enrollment.
Certificate in National Security Studies

national-security.jhu.edu

The Certificate in National Security Studies is the perfect vehicle for students looking to expand their understanding of the security environment facing the US in our new century and the tools and strategies available for managing it. It is particularly appropriate for those students who wish to understand the role of science and technology in the security realm. The Certificate in National Security Studies draws on experts in government, international relations, bioscience and military affairs. It provides students the tools to analyze and challenge the United States in the national security realm.

Students in other fields who want to have a national security credential can pair the Certificate in National Security Studies with other Johns Hopkins degree programs. These include:

- Programs in Biotechnology
- MS in Energy Policy and Climate
- MS in Applied Economics
- MA in Government

ADMISSION REQUIREMENTS

Application Documents
Submit to Advanced Academic Programs (AAP) Admissions Office (aapadmissions@jhu.edu or fax 202.452.1970):

- AAP application and fee
- Official undergraduate transcript indicating a minimum grade-point average of 3.0 on a 4.0 scale.
- A current résumé
- Two letters of recommendation
- A statement of purpose outlining why you wish to study at JHU and how studying at JHU will help you realize your ambitions.

CORE COURSES

Students take two core courses, one from each area below:

- Science
- Security studies

National Security Studies courses are designated by 406, and the course descriptions follow this list. Students may also have Global Security Studies courses designated as 407 courses, Biotechnology Studies courses designated as 410 courses, classes in Geographic Information Systems designated as 430 courses, and classes in Energy Policy and Climate designated as 425 courses—course descriptions for each can be found in the program's respective section of this catalog.

In addition, students select three electives for a total of five courses.

Please refer to the Advanced Academic Programs Course Schedule (advanced.jhu.edu) for exact dates, times, locations, fees and instructors. Courses are open only to students who meet admission requirements.

PROGRAM COMMITTEE

Steven David
Professor of Political Science

Benjamin Ginsberg
David Bernstein Professor of Political Science; Chair of the Center for Advanced Governmental Studies

Bertrand Garcia-Moreno
Professor of Biology, Program Chair; Advanced Biotechnology Studies

Mark Stout
Program Advising

Certificate in National Security Studies

national-security.jhu.edu
ELECTIVE COURSES

Select three. These courses are samples. You may take other classes than those with the written permission of the program director for National Security Studies.

National Security Studies
- 406.668 Intelligence and Counter-Terrorism
- 406.673 Cyberforce Superiority: Foundational Elements
- 406.676 The Politics of Cybersecurity
- 406.693 Constitutional Issues in National Security

Government
- 470.659 Radicalization and Deradicalization in Terror Networks
- 470.665 Warfare by Other Means: Espionage and Covert Action in Foreign Policy
- 470.676 Understanding Islamist Politics and Terrorism
- 470.679 Legislative Process in Congress
- 470.680 The Future of U.S. Intelligence: Issues, Options and Opportunities
- 470.685 The Politics of Cybersecurity
- 470.692 Military Strategy and National Policy
- 470.693 Complex Decisionmaking in National Security
- 470.711 Intelligence: From Secrets to Policy
- 470.713 Civil Resistance: The Logic of Strategic Nonviolent Conflict
- 470.722 Intelligence and, War
- 470.734 Energy, Vulnerability, and War
- 470.740 Conflict and Security in Cyberspace
- 470.746 Understanding Contemporary Iran
- 470.751 Politics and Security in the Middle East
- 470.760 National Intelligence Systems: A Comparative Study
- 470.785 The American Way of War

Advanced Biotechnology Studies
- 410.692 Biological & Chemical Threat Response & Forensics
- 410.693 Science, Medicine & Policy in Biodefense

Geographic Information Systems
- 430.601 Geographic Information Systems (GIS)
- 430.602 Remote Sensing: Earth Observing Systems and Applications

For those interested in earning a master's degree, the Government program offers an MA in Global Security Studies.

CERTIFICATE IN NATIONAL SECURITY STUDY PAIRINGS (OPTIONAL)

MS in Biotechnology/ Certificate in National Security Studies
The Certificate in National Security Studies may also be taken jointly with the MS in Biotechnology. Applicants interested in pursuing both degrees simultaneously should apply to the joint program. Current students enrolled in either the MS in Biotechnology or the NSS Certificate may apply for the joint program at any time (prior to the completion of the initial degree or certificate).

Students already accepted and/or enrolled in Advanced Biotechnology Studies who wish to add the NSS Certificate as part of their program, may do so by completing the application to the joint MS in Biotechnology/NSS Certificate (fee and letter of recommendation waived).

Students already accepted and/or enrolled in the NSS Certificate who wish to add the MS in Biotechnology to their program of study, may do so by completing the application to the joint MS in Biotechnology/NSS Certificate (fee waived).

Admission in either the Certificate or the MS in Biotechnology neither confers nor implies admission to the other program. The decisions on admission to each program are made by their respective admission committees alone.

Enrolled students must complete all requirements of the MS in Biotechnology with a concentration in biodefense, and take the following courses to receive the NSS certificate:

Students will take
1. 470.606 American National Security
2. 410.692 Biological & Chemical Threat Response & Forensics
3. 410.693 Science, Medicine & Policy in Biodefense
4. NSS Elective
5. NSS Elective

MS in Energy Policy and Climate/ Certificate in National Security Studies
The Certificate in National Security Studies may also be taken concurrently with the MS in Energy Policy and Climate. Those with an interest in both programs should apply to each and reference the concurrent program in their personal statement. Students choosing this option must meet the following course of study:

Students will take
1. 470.606 American National Security
2. Elective from NSS
3. Elective from NSS
4. 425.601 Principles and Applications of Energy Technology
5. 425.602 Science of Climate Change and its Impact

MS in Applied Economics/ Certificate in National Security Studies
The Certificate in National Security Studies may also be taken concurrently with the MS in Applied Economics. Those with an interest in both programs should apply to each and reference the concurrent program in the personal statement.
COURSE DESCRIPTIONS

Core Courses

406.667 Social Science, National Security, and Intelligence
This online course examines the role of social science in intelligence and national security policy formulation and decisionmaking. It describes the nature of the various social sciences and their ways in which they can potentially contribute to national security. It help students understand how social science has actually contributed to key national security issues and the ambivalent relationship between social scientists and the national security communities, particularly the military and intelligence agencies. The course will also help students become savvy consumers of social science.

406.671 Congress & Homeland Security
This course explores the partnership of the legislative branch with the Department of Homeland Security (DHS). Students will explore the Hill's critical role in helping create DHS and examine the evolving relationship of congressional oversight and legislative mandates. Issues to be covered include jurisdiction of committees, the budget, authorization and appropriation processes, committee interactions and more. The course will explore these topics against the backdrop of real world cases and issues.

406.673 Cyberforce Superiority: Foundational Elements
This course provides students a baseline understanding of cyber programming, networking, and computer network operations. Students will also receive a solid foundation in the historical, legal, ethical and policy aspects of computer network operations and their relevance to today's events and priorities. The course then reviews the functioning of computers, after which the students receive hands-on education in programming concepts, Windows and Linux tools, Boolean logic and computer math principles that lay the groundwork for a tactile understanding of cyber concepts and skills. Students are not expected to have specialized computer skills.

406.674 Cyberforce Superiority II: Network Operations
It is difficult in the extreme to understand cyber policy without understanding actual cyber operations. In this follow-on to 406.673 Cyberforce Superiority I: Foundational Elements, students will be given a more in-depth understanding of networking concepts and hardware with a focus on how network architecture influences cyber attack, defense and exploitation. Students will learn hands on offensive and defensive network operations and be provided an environment to demonstrate new skills by the use of hands on exercises and labs. Students will continue to learn about exploitation and defense of networks building further on the basic mathematics behind how computer data is represented, how computer operations are governed, and how multiple computers interact through network communication while also understanding network vulnerabilities from offensive and defensive tactics and protocols. Students will gain an understanding of how hardware and software necessary to construct a secure network of computers is key to both defensive and offensive network operations. PREREQUISITE: 406.673 Cyberforce Superiority I: Foundational Elements.

406.676 The Politics of Cybersecurity
In recent years, the United States has become dependent on cyber virtual networks as the engine for our society. However, this digital infrastructure remains extremely vulnerable to cyber attacks. Protecting the networks we rely on presents unique challenges, as networks are without borders and bear the stress of attack millions of times each day. This course will explore the challenges and political factors impacting the judicial, legislative, executive branch agencies of Department of Defense, Homeland Security, National Security Agency, and private industry as they all work to secure and create a national cyber security apparatus.

The intelligence community is facing an enormous challenge in working to prevent the transfer of the United States' intellectual property and identifying the cyber attackers. We will discuss the political implications of establishing laws addressing how information is to be shared between governments and industry and the authorities needed for the DoD and intelligence community to operate domestically. We will discuss the impact of the creation of the Department of Homeland Security and examine the evolving relationship of Congressional oversight and legislative mandates. Issues such as jurisdiction of congressional committees, the budget, and the authorization and appropriations processes will be covered. Major policy and counter-terrorism issues of special concern to Congress will also be addressed in this course. Guest speakers will be invited from DHS, Capitol Hill and the media, allowing us to examine the issues from a variety or perspectives.

406.677 Social Science, National Security and Intelligence
This course examines the role of social science in national security decision making and intelligence. The course lectures, readings and classroom discussion are intended to help students understand the ambivalent relationship between social scientists on the one hand and intelligence personnel and national security policy makers on the other. It also considers the opportunities and limitations in the ways social science could contribute to policy making and how social science has contributed to key national issues. The course will help the student become a savvy consumer of social science. Counts toward Security Studies Concentration.

406.680 Science, Technology and National Security
This survey course will explore the role of science and technology in the national security of our nation. The Federal role in funding science and technology along with a description of the Federal Laboratories will be discussed. An overview of the physics and chemistry behind various national security issues will be presented. These issues will include situations involving chemical, biological and explosive compounds and the science behind the tasks of sensing and protection involving these threats. The science and engineering of topics such as remote sensing, unmanned vehicles, and energy will also be addressed. The course will be conducted in a part lecture/part discussion format.

406.681 Technology of Weapons of Mass Destruction
Students gain the foundational knowledge behind WMD (both weapons of mass destruction and weapons of mass disruption)
and about how these weapons threaten U.S. homeland security. Weapons of mass destruction traditionally include nuclear, biological, and chemical weapons, while weapons of mass disruption include radiological weapons, such as “dirty bombs.” In addition, the course covers the technology behind three WMD delivery vehicles: ballistic missiles, cruise missiles, and unmanned aerial vehicles. In assessing each WMD threat, the course first examines the science and technology for each type of weapon and then applies this theory to real world threats emanating from state and non-state actors. Students apply this knowledge by engaging in red team exercises to identify options for preventing and reducing vulnerabilities from WMD. Please note that students do not have to have prior technical knowledge about WMD issues to succeed in this course.

406.683 Weapons of War: The Technology and Uses of Weapons

Modern warfare utilizes advanced weapons systems. This course will examine various weapon systems ranging from artillery, cruise missiles, aircraft, aircraft launched weapons, ships, submarines and unmanned systems. We will also examine strategic and tactical nuclear weapons. In the examination we will look at capabilities, concepts of operation, and issues surrounding their procurement and use. The course will also involve students working through a crisis scenario utilizing various weapon systems. No pre-existing technical knowledge is assumed nor is any required.

Elective Courses

406.668 Intelligence and Counter-Terrorism

Counterterrorism is essentially an intelligence war. By definition, both sides use small forces and clandestine means, hiding their presence and activities not only from each other, but often from friends and allies as well. This course will explore the many roles of intelligence in every facet of counterterrorism, and ask students to evaluate their practical, legal, and moral effects and implications. It will also look at the terrorists’ own intelligence activities, and the “intelligence race” between terrorists and counterterrorists.

406.669 Homeland Security: Threats, Challenges and Solutions

This course will explore Homeland Security Threats, Challenges and Solutions by first reviewing historic United States Domestic Security practices and then studying the recent monumental undertaking of creating new national policy and procedures defining how the United States protects itself from threats. Finally, focusing on future challenges the Federal Government will need to address in planning, integrating and operating against the apocalyptic threat of radical terrorism and preparing for domestic disasters. Specific issues such as Border Security, Aviation Security, Emergency Management, Critical Infrastructure Protection, Cyber Security, Privacy; and Federal and State budgets used to pay for future domestic security will be key topics in this course.

406.693 Constitutional Issues in National Security

This course examines the interpretation of constitutional powers and rights under conditions of heightened national security. We will consider the Supreme Court’s role in constitutional interpretation, and the balance of power among the three branches. The course will also examine the tension between security and liberty during a time of war. Topics covered during this semester will include military tribunals, unitary theory of the executive, congressional oversight, war-making power, and treatment of detainees.
The M.S. in Research Administration is designed to accommodate both career practitioners and those who seek a career in research administration. The program requires that students complete a core curriculum of four courses, as well as a minimum of two specialized tracks. As part of the core curriculum, students must either write a thesis or engage in an approved capstone project. In all, the total number of credit courses taken must be 12 or higher. Courses within tracks are grouped in areas of interest to benefit students who work or want to work in various areas of research administration, or who may have varying levels of experience or special needs. Two tracks must be completed (4 courses in each) in order for students to meet degree requirements. Non-degree-seeking students may enroll in track courses with special student status, but they must formally apply to the degree program, and be accepted, if they decide to seek a degree.

COURSE REQUIREMENTS

> Four core courses
> Each track has one required course
> Six elective courses

Core Courses

475.601 Introduction to Research Administration*
475.602 Organization and Leadership for Research Administration*
475.604 Introduction to Legal, Ethical, Regulatory and Compliance Issues*
475.800 Capstone Project in Research Administration OR
475.850 Research and Thesis I

CURRICULUM TRACK 1
Program Administration and Facilitation
(One required course and choose any 3 courses)

475.603 Assistive Technologies for Research Administration
475.605 Program Development and Evaluation
475.606 Project Management of Sponsored Programs (Required)
475.608 Procurement and Award Processes
475.607 Grantsmanship, Grant Writing, and Evaluation of Grant Proposals

Interdisciplinary Courses

470.709 Introduction to Quantitative Research Methods
470.639 The Nature of Nonprofits: Culture, Governance, and Management OR

CURRICULUM TRACK 2
Financial Management of Sponsored Programs
(One required course and choose 3 courses)

475.603 Assistive Technologies for Research Administration
475.609 Financial Management of Sponsored Programs (required)
475.610 Financial Accounting and Compliance Auditing
475.611 Reporting and Statistical Analysis for Sponsored Programs
475.617 The Federal Acquisition Regulations and Defense Contracting

Interdisciplinary Courses

470.709 Introduction to Quantitative Research Methods
470.798 Financial Management and Analysis in Nonprofits OR
470.645 The Budgetary Process OR
470.627 Financial Management and Analysis in the Public Sector

CURRICULUM TRACK 3
Compliance, Legal, and Regulatory Issues
(One required course and choose 3 courses)

475.603 Assistive Technologies for Research Administration
475.612 Intellectual Property, Technology Development, and Technology Transfer
475.613 Advanced Topics in Compliance, Legal, and Regulatory Issues (required)
475.614 Managing Compliance, Legal and Regulatory Issues in Research Hospitals and Health Care
475.615 Research Contracts and Industrial Agreements: Domestic and International
475.616 Domestic and International Special Issues in Research, Legal and Regulatory Affairs

PROGRAM ADVISING

Marianne R. Woods, Ph.D., J.D.
Program Director
mwoods9@jhu.edu
202.663.5987
**Interdisciplinary Courses**

410.649 Introduction to Regulatory Affairs (Prerequisites in Biotechnology apply)

410.687 Ethical, Legal & Regulatory Aspects of the Biotechnology Enterprise (Prerequisites in Biotechnology apply)

**Continuation Thesis and Capstone Course (as needed)**

470.888 Thesis Continuation (non-credit)

*Required courses.

**CURRICULUM**

Students in the Research Administration program will receive a firm foundation, through the core curriculum, for understanding how the research enterprise is organized worldwide and within the United States, how university and college research offices are organized and led, how the federal and non-profit sectors facilitate research as well as how they are organized, funded, and led. Through the core curriculum, students will be introduced to the basics of the management for sponsored programs, including finances, information technology, as well as legal, ethical, regulatory and compliance issues. In addition to the core, students may elect two additional tracks. The program’s tracks allow students to choose from several groupings in: Program Administration and Facilitation, Financial Management of Sponsored Programs, and Compliance, Legal, and Regulatory Issues. As part of the core curriculum, students will be required to elect either a thesis or capstone project, which will be initiated within the core curriculum sequence and completed while the students take elective courses or, through continuous enrollment, within five years. The curriculum has been developed to prepare students with skills identified by several national associations, including: the National Grants Management Association (NGMA) and the Research Administrators Certification Council (RACC). Students wishing to do so may independently attempt the RACC Certification exam or the CGMS (Certified Grants Management Specialist) exam to earn a non-credit credential in addition to a degree.

The program prepares emerging leaders in research administration to face complex management challenges of today. Students will gain an appreciation for these issues through their core courses and their electives. Twelve courses, including a Capstone project, are necessary to complete the degree.

**Sequence of Study**

Students should make every effort to take the core courses, other than the capstone, in their first two semesters. The final required course of the program is the Capstone Project in Research Administration or the Research and Thesis Project, which students can only take in their final semester.

**Capstone**

The Capstone project or the Research and Thesis project enables students to apply and synthesize their knowledge, develop expertise on a topic related to research administration, work closely with experts in the field, and improve professional writing and presentation skills.

The Capstone Seminar is the culmination of the Master of Science in Research Administration where students will integrate and build on their previous coursework in the program to apply it to practical settings. Students will identify and analyze an issue or problem and propose a solution during this semester long course. Those electing the Capstone may explore issues related to a current research administration project in a “real world” setting. This original work can be for the organization or agency for which the student works or for a hypothetical organization, but it should result in the student conducting original research and applying strategies, testing solutions, and using tools to meet the particular needs of chosen work environment.

**COURSE DESCRIPTIONS**

**Core Courses**

**475.601 Introduction to Research Administration (required)**

Provides an overview of research administration including how it has evolved in the United States, the role it plays nationally and at the state level, and how conducting research in the U.S. differs from elsewhere. The course also examines the research continuum and the research enterprise as it exists in higher education, nonprofit organizations, and the federal government. The course allows students the opportunity to become familiar with issues, problems and strategic outcomes as they affect research administration.

**475.602 Organization and Leadership for Research Administration (required)**

Examines the organizational models, business processes, and required infrastructure for multi-sector research administration. Students also explore the qualities and requirements for successful leadership of research administration organizations, examining, in particular, how university, federal, and non-profit research administration organizations are managed and led.

**475.604 Introduction to Legal, Ethical, Regulatory and Compliance Issues (required)**

Students examine the legal, ethical, and regulatory framework underlying most research activities in the U.S. Students discuss the trajectory of legal, ethical, regulatory and compliance issues affecting research administration, including the role of Congress, the role of the Executive Branch of government, and the role of federal and state agencies in the issuance and auditing of compliance regulations. Students also discuss practical considerations for human subjects and animal research, sponsor relationships and affiliations, data retention, biosafety, scientific attribution, and accurate reporting.
475.800 Capstone Project in Research Administration (*required)
The Capstone Seminar is the culmination of the Master's in Research Administration where students will integrate and build on their previous coursework in the program to apply it to practical settings. Students will identify and analyze an issue or problem and propose a solution during this semester long course. Those electing in the Capstone may explore issues related to a current research administration projects in a “real world” setting. This original work can be for the organization or agency for which the student works or for a hypothetical organization, but it should result in the student conducting original research and applying strategies, testing solutions, and using tools to meet the particular needs of chosen work environment.

OR

475.850 Research and Thesis (*required)
The purpose of this core course is for students to refine their thesis topic, develop their research design and complete a working outline for their thesis. Students will begin to research and write their thesis during this class in earnest. The course format is working sessions focused on specific research-oriented tasks. Emphasis will be placed on completing the literature review and methodology sections of the thesis. Students will also complete by semester end a preliminary chapter of their thesis papers.

475.888 Thesis and Capstone Continuation (1 credit, does not count toward degree)
This is a one credit course required for those who have completed all of their course work including the Research and Thesis class or the Capstone Project in Research Administration class, but who are still working on their thesis or Capstone project.

CURRICULUM TRACK 1
Program Administration and Facilitation

475.603 Assistive Technologies for Research Administration (offered as an elective in all three curriculum tracks but may only be taken once)
This course explores the role of software applications and systems utilized by research administrators and by those seeking and receiving funding. Students examine and compare software applications such as COEUS, SunGard Public Sector, Grants.Gov, GrantsOnline, Conversis, ERA Software, HealthRx, and others.

475.605 Program Development and Evaluation
This course explores ways in which initiatives become sponsored programs, the role of strategic planning, how proposals are designed and disseminated, how responses are solicited and evaluated. This course looks at the role of training grants, curriculum building grants, instructional grants, capacity building grants, construction grants, and other awards that are programmatic in nature. It also examines the important role of evaluation and the uses of programmatic evaluation in changing the learning and service environment.

475.606 Project Management of Sponsored Programs (Track required)
This course examines major grants and contracts and how these research and sponsored programs are designed and implemented. It also looks at how major programs and projects are managed utilizing current project management theory, best practices, case studies, and research. Issues related to resource management, team building, problem solving and progress reporting will be discussed.

475.608 Procurement and Award Processes
Provides a detailed examination of request for proposal (RFP) and award processes from the perspective of those planning and offering them. Students compare and contrast these processes in different environments, including federal and foundation grant-making and private sector funding for specific projects.

475.607 Grantsmanship, Grant Writing, and Evaluation of Grant Proposals
This course describes the process of applying for, writing, and evaluating grants and sponsored program opportunities offered through non-profit, foundation, think-tank, government, and university settings. Emphasis is placed on how to evaluate opportunities, how to use online resources, how to ensure that prerequisites are met, and how to respond to RFPs with fully-vetted, well-written proposals. Students will be required to write and edit portions of proposals as well as evaluate current opportunities.

Interdisciplinary Courses

470.709 Introduction to Quantitative Research Methods
Solutions to both political and policy problems increasingly require an understanding of how to analyze data. Political campaigns collect data to identify potential supporters and donors. Government agencies analyze data to evaluate programs. Research organizations use data to support their policy positions. This course will provide students with the knowledge and skills needed to perform a cutting-edge statistical analysis. You will learn how to design and test regression models using Stata, an incredibly powerful and widely-used statistical software package. The focus of the course will be on using statistical methods in an applied manner. We will concentrate on using statistics to answer political and policy questions, not on the underlying mathematical theories. There is no prerequisite; only an interest in and commitment to learning quantitative methods are required.

470.639 The Nature of Nonprofits: Culture, Governance, and Management
This course examines the nature and culture of nonprofit organizations. Students consider the strengths, constraints, and unique characteristics of a sector that has captured surprisingly little attention from policy analysts, but upon which government and the public increasingly rely for social services, education, and health care. Case studies help to illustrate and define the decision-making processes, management, and operational style of this important part of the nation’s service delivery infrastructure.

OR
470.610 Financial Accounting and Compliance Auditing
Focuses on the specifics of financial and non-financial auditing as related to sponsored programs and grants. The audit process is examined in detail and the roles of the compliance officer, auditors, the PI and project participants are discussed. Special attention is paid to compliance pitfalls, record keeping, information technology, and accepted accounting standards and practices.

475.611 Reporting and Statistics for Sponsored Programs
Provides hands-on opportunities for students to understand reporting requirements and work with the types of reports required for research projects and sponsored programs. The course examines reporting as a CRM (customer relationship management) and PM (project management) strategy, as well as special requirements affecting research administration. Specific types of reporting requirements are analyzed, including federal government agency-based requirements, Star Metrics, GSA Schedule, and foundation.

475.617 The Federal Acquisition Regulations and Defense Contracting
Provides an in-depth analysis of the Federal Acquisition Regulations, including how to read the FARS and FAR Supplements, how to work with federal defense procurement regulations, how to work with defense contractors. Includes a thorough analysis of contract requirements, carve out clauses for higher education and non-profit organizations, and subcontracting issues including flow down clauses, troublesome clauses, monitoring of sub-recipients, technical data, and intellectual property. A look at the federal agencies and industry contractors utilizing the FARS will be discussed.

Interdisciplinary Courses
470.709 Introduction to Quantitative Research Methods
Solutions to both political and policy problems increasingly require an understanding of how to analyze data. Political campaigns collect data to identify potential supporters and donors. Government agencies analyze data to evaluate programs. Research organizations use data to support their policy positions. This course will provide students with the knowledge and skills needed to perform a cutting-edge statistical analysis. You will learn how to design and test regression models using Stata, an incredibly powerful and widely-used statistical software package. The focus of the course will be on using statistical methods in an applied manner. We will concentrate on using statistics to answer political and policy questions, not on the underlying mathematical theories. There is no prerequisite; only an interest in and commitment to learning quantitative methods are required.

470.798 Financial Management and Analysis in Nonprofits
The basic tools for financial management and analysis are covered in this course with a focus on those aspects that will: 1) provide needed skills to students planning careers in public and nonprofit organizations and 2) provide those working for government with tools to evaluate nonprofit and private sector organizations with which they interact. Topics include legal and audit requirements for financial reporting, disclosure laws, and state and federal registration requirements. The course will also address interpreting financial statements and assessing and managing for financial health. These basic management tools are necessary not only for basic financial management but also for creating the financial component of a Request For Proposal (RFP) from a U.S. funding source and for those striving for organizational sustainability through “social enterprise” or earned income ventures in general.

OR
470.645 The Budgetary Process
The federal budget process is an enormously complex mixture of administrative routines and mechanisms designed to bias decisions, avoid blame, or reduce conflict. This course explores the structures of federal budgeting in terms of its varied goals and in the context of the wider governing process. The course will review the budgetary process in both the executive and congressional branching, as well as the interaction of those two systems. In order to gain understanding of the difficult policy choices and political pressures policymakers face, students will be asked to do a simulation of a budget process within the executive branch. The role of entitlements, scoring issues, and tax policy will be examined in the context of the debate over budget policy. The course will start with a short primer on finance theory.

OR
470.627 Financial Management and Analysis in the Public Sector
Many Americans believe that there was a time when citizens were free of government controls. But there always have been
significant government controls, which in our day we call public policies. This course analyzes major economic policy tools and their advantages and disadvantages. It provides an overview of issues confronting the American economy today including productivity, employment, international trade, and distribution of wealth and incomes. Students explore specific policy tools available to influence economic outcomes, among them monetary and fiscal policy, trade regulation, grant making, entitlement spending, and specialized interventions such as health care.

**CURRICULUM TRACK 3**

**Compliance, Legal, and Regulatory Issues**

**475.612 Intellectual Property, Technology Development, and Technology Transfer**

This course examines the role of research administrators in safeguarding Intellectual Property (IP), identifying patentable material, creating and operating a technology transfer office, facilitating various aspects of technology transfer, and developing and implementing such specialized agreements as non-disclosure agreements, material transfer agreements, licensing agreements and other related intellectual property agreements. Students examine case studies, case law, institutional and agency policies.

**475.613 Advanced Topics in Compliance, Legal, and Regulatory Issues (Track required)**

This course examines in-depth advanced issues of compliance, legal and regulatory affairs. Students will examine and discuss critical issues and real world applications in research compliance such as adult and embryonic stem cell research, tissue centers, use of special populations in research, informed consent, use of primates in research, and classified research. This course will also look at the issues affecting high containment research and facilities, infectious diseases research, and the regulatory agencies that govern these special areas.

**475.614 Managing Compliance, Legal and Regulatory Issues in Research Hospitals and Health Care**

This course looks at what is needed to develop, maintain, and manage compliance, legal and regulatory issues in a research hospital or health care setting. The elements of patient care, clinical trials, and other research administration issues affecting healthcare are discussed. Areas such as the Physicians Self-Referral (Stark) Law, Anti-kickback laws, HIPPA and HITECH regulations as well as the Privacy Rule, and the Security Rule are examined. Elements of a good compliance program are also discussed.

**475.615 Research Contracts and Industrial Agreements: Domestic and International**

This course examines how to prepare and execute research contracts and industrial agreements. It examines issues affecting both domestic and international contracting, including issues such as U.S. regulations that affect the contracting process, good terms and conditions in research contracts, maintain your nonprofit status, safe harbor laws, unrelated business income, and profit v nonprofit legal issues. The course also examines issues related to the human dynamics and cultural aspects of international and industrial contacting.

**475.616 Domestic and International Special Issues in Research, Legal and Regulatory Affairs**

This course discusses special issues both domestic and international that affect research administration. Special issues such as seeking, obtaining, and monitoring an export control license, issues affecting research with pharmaceutical companies, issues affecting small business contracting, and requirements for international conflict of interest, research integrity, and use of research results will be discussed.

**Interdisciplinary Courses**

**410.649 Introduction to Regulatory Affairs (Prerequisites in Biotechnology apply. Contact the Director of the MS in Research Administration)**

Regulatory affairs (RA) comprise the rules and regulations governing product development and post-approval marketing. In the U.S., the FDA establishes and oversees the applicable regulations under several statutes, many regulations, and partnership with legislators, patients, and customers. Biotechnology products may be classified as drugs, biologics, or medical devices. Each type is regulated by a different center within the FDA. This course provides an overview of RA, its effect on product development. Topics include: RA history, regulatory agencies, how to access regulatory information, drug submissions, biologics submissions, medical device submissions, GLP, GCP, GMP, and FDA inspections.

**410.687 Ethical, Legal & Regulatory Aspects of the Biotechnology Enterprise (Prerequisites in Biotechnology apply. Contact the Director of the MS in Research Administration)**

This course provides an overview of the important ethical, legal and regulatory issues that are critical to the biotechnology industry. The course shares current trends and essential elements of ethics, legal issues and regulations in a way that allows for an appreciation of how each influences the others. Students will examine core ethical values that guide the practice of science in the biotechnology industry. The course will provide an overview of legal issues such as protecting inventions and intellectual property and licensing, and the range of regulatory oversight mechanisms with which the biotech industry must comply. This course will review the implications of strategic ethical, legal and regulatory choices that add value to the biotechnology firm, customers and society.

**Electives (Based on Certification Tracks)**

**410.649 Introduction to Regulatory Affairs**

Regulatory affairs (RA) comprise the rules and regulations governing product development and post-approval marketing. In the U.S., the FDA establishes and oversees the applicable regulations under several statutes, many regulations, and partnership with legislators, patients, and customers. Biotechnology products may be classified as drugs, biologics, or medical devices. Each type is regulated by a different center within the FDA. This course provides an overview of RA, its effect on product development. Topics include: RA history,
regulatory agencies, how to access regulatory information, drug submissions, biologics submissions, medical device submissions, GLP, GCP, GMP, and FDA inspections.

410.675 International Regulatory Affairs
The course provides a review and analysis of the pharmaceutical/biotechnology product approval processes within the world’s major markets. The key strategies required in preclinical product development to marketing approval of the products in Europe, Japan, and the United States will be compared and discussed. Students will explore the European Union (EU) regulations and their overall importance on international markets. The course will cover the salient features of common technical and regulatory documents required for submission and approval to the leading regulatory bodies in the world, general guidance documents, International Harmonization, and General Agreement on Tariffs and Trade (GATT).

470.616 Law of Public Institutions
Since laws determine the missions of federal departments and agencies and their ability to carry out these missions, it is crucial that students have a solid understanding of these laws. Focusing on specific institutions and cases, students become familiar with major laws, regulations, procedures, judicial decisions, and their practical consequences for the operation of the federal government. Students also investigate the relationship of government to the private sector.

470.627 Financial Management & Analysis in the Public Sector
Many Americans believe that there was a time when citizens were free of government controls. But there always have been significant government controls, which in our day we call public policies. This course analyzes major economic policy tools and their advantages and disadvantages. It provides an overview of issues confronting the American economy today including productivity, employment, international trade, and distribution of wealth and incomes. Students explore specific policy tools available to influence economic outcomes, among them monetary and fiscal policy, trade regulation, grant making, entitlement spending, and specialized interventions such as health care.

470.645 The Budgetary Process
The federal budget process is an enormously complex mixture of administrative routines and mechanisms designed to bias decisions, avoid blame, or reduce conflict. This course explores the structures of federal budgeting in terms of its varied goals and in the context of the wider governing process. The course will review the budgetary process in both the executive and congressional branching, as well as the interaction of those two systems. In order to gain understanding of the difficult policy choices and political pressures policymakers face, students will be asked to do a simulation of a budget process within the executive branch. The role of entitlements, scoring issues, and tax policy will be examined in the context of the debate over budget policy. The course will start with a short primer on finance theory.

470.667 The Administrative State: How Washington Regulates
The regulatory process is neither simple nor straightforward. Congress writes the laws, which authorize or require the federal agencies to act (or prohibit them from acting). This course will explore why Congress delegates to the agencies, how much it may delegate, and how it influences the use of the power it has delegated. Most of the federal agencies are in the executive branch of the government, headed by the president; the rest are so-called independent regulatory agencies. How much authority does the president have in appointments and removal and in policy guidance, and what means does he use to exercise that power? What are the procedural requirements the agencies must follow in developing regulations? What are the substantive requirements (e.g., the role of science and economics)? What influence does the public have, including the general public, the states and local governmental entities, and the special interests? The course will conclude with the role of the courts, which ultimately must decide questions of statutory interpretation and constitutional law. (Cross-listed with the Biotechnology Program)

470.709 Quantitative Methods
Solutions to both political and policy problems increasingly require an understanding of how to analyze data. Political campaigns collect data to identify potential supporters and donors. Government agencies analyze data to evaluate programs. Research organizations use data to support their policy positions. This course will provide students with the knowledge and skills needed to perform a cutting-edge statistical analysis. You will learn how to design and test regression models using Stata, an incredibly powerful and widely-used statistical software package. The focus of the course will be on using statistical methods in an applied manner. We will concentrate on using statistics to answer political and policy questions, not on the underlying mathematical theories. There is no prerequisite; only an interest in and commitment to learning quantitative methods are required.

470.720 Science and Government
Science forms the heart of many of our most contentious national issues, from climate change to stem cell research, from teaching evolution to exploring space. Americans view science with both suspicion and awe. We support science watchdog organizations, while we also support increased spending on scientific and medical research. We worry that science opens Pandora’s box, yet we look to scientists and engineers to provide solutions in fields such as medicine and alternative energy. This course examines this national paradox, by exploring the interrelations among government, the scientific community, and concerned citizens. The course will pursue the questions of why and how the government supports so much science, and what role science & engineering play in the nation’s social and political aspirations.

470.730 Intellectual Property Law
This course, taught by a sitting federal judge, will survey intellectual property law, including patent, copyright, and trademark law. The course will cover the basics of intellectual property and will be taught like a law school class using the
case method. The course will also introduce students to the fundamentals of legal analysis. There will be no exam; students will be required to write a paper.

470.798 Financial Management and Analysis in Nonprofits
The basic tools for financial management and analysis are covered in this course with a focus on those aspects that will: 1) provide needed skills to students planning careers in public and nonprofit organizations and 2) provide those working for government with tools to evaluate nonprofit and private sector organizations with which they interact. Topics include legal and audit requirements for financial reporting, disclosure laws, and state and federal registration requirements. The course will also address interpreting financial statements and assessing and managing for financial health. These basic management tools are necessary not only for basic financial management but also for creating the financial component of a Request For Proposal (RFP) from a U.S. funding source and for those striving for organizational sustainability through "social enterprise" or earned income ventures in general.

470.888 Thesis Continuation
This is a non-credit course required for those who have completed all of their course work including the Research and Thesis class, but who are still working on their thesis or Capstone project.

475.603 Assistive Technologies for Research Administration
This course explores the role of software applications and systems utilized by research administrators and by those seeking and receiving funding. Students examine and compare software applications such as COEUS, SunGard Public Sector, Grants.Gov, GrantsOnline, Conversis, ERA Software, HealthRx, and others.

475.605 Program Development and Evaluation
From the perspective of funders, this course explores ways in which initiatives become sponsored programs, the role of strategic planning, how proposals are designed and disseminated, how responses are solicited and evaluated. The important role that communication plays is emphasized, and communication strategies and work products are examined. The course also allows students to become familiar with key roles and relationships, such as those played by the program officer, the proposal development specialist, and the principle investigator.

475.606 Project Management of Sponsored Programs
Examines how research projects and sponsored programs are best managed utilizing current project management theory, best practices, case studies, and research. Issues related to HR and resource management, team building, problem solving and progress reporting will be discussed.

475.607 Grantsmanship, Grant Writing, and Evaluation of Grant Proposals
Describes the process of applying for, writing, and evaluating grants and sponsored program opportunities offered through non-profit, foundation, think-tank, government, and university settings. Emphasis is placed on how to evaluate opportunities, how to use online resources, how to ensure that prerequisites are met, and how to respond to RFPs with fully-vetted, well-written proposals. Students will be required to write and edit portions of proposals as well as evaluate current opportunities.

475.608 Procurement and Award Processes
Provides a detailed examination of request for proposal (RFP) and award processes from the perspective of those planning and offering them. Students compare and contrast these processes in different environments, including federal and foundation grant-making and private sector funding for specific projects.

475.609 Financial Management of Sponsored Programs
Provides an introduction to topics related to financial operations of sponsored programs, including how to establish a financial reporting system, budgeting, effort reporting, preparing for and engaging in an audit, procuring resources, and sub-contracting. Students also learn how to translate the financial terms of a proposal into a project budget and how to engage in specialized oversight and reporting, such as required for projects undertaken within the GSA Schedule.

475.610 Financial Accounting and Compliance Auditing
Focuses on the specifics of financial and non-financial auditing as related to sponsored programs and grants. The audit process is examined in detail and the roles of the compliance officer, auditors, the PI and project participants are discussed. Special attention is paid to compliance pitfalls, record keeping, information technology, and accepted accounting standards and practices.

475.611 Reporting for Sponsored Programs
Provides hands-on opportunities for students to understand reporting requirements and work with the types of reports required for research projects and sponsored programs. The course examines reporting as a CRM (customer relationship management) and PM (project management) strategy, as well as a requirement. Specific types of reporting requirements are analyzed, including federal government agency-based requirements, GSA Schedule, and foundation.

475.612 Intellectual Property and Technology Transfer
Examines the role of research administrators in safeguarding Intellectual Property (IP), identifying patentable material, creating and operating a technology transfer office, facilitating various aspects of technology transfer, and developing and implementing such specialized agreements as non-disclosure agreements, material transfer agreements, licensing agreements and other related intellectual property agreements. Students examine case studies, case law, institutional and agency policies.
Even as technology and globalization alter our lives, creative writing remains essential to human expression. Through intensive writing and challenging reading, students in the Master of Arts in Writing Program develop as writers in their choice of two concentrations: Fiction and Nonfiction. Students interested in writing about science, medicine, or technology should consider our new Master of Arts in Science Writing Program, which is online/low-residency and also offers a graduate certificate. See page 190. In the Writing Program, experienced faculty members, all practicing writers or editors, provide expert direction and constructive criticism to help students craft successful short stories, essays, articles or books. Applicants to this part-time program may seek the entire master’s degree or only a course or two of special interest.

Students in the Writing Program learn primarily through the practice of writing; literature is studied to clarify approaches to craft. Depending on student goals, the program offers a broad foundation in fine arts/creative writing, in journalism/professional writing, or in both fields. Some students cultivate skills to prepare for a career; others are seasoned writers who want to change focus; still others favor artistic exploration over professional ambition. Within the realm of literary writing, students have the flexibility to develop individual styles and pursue specialized subjects. The program’s goal is to create a nurturing yet demanding environment where creative writers of diverse promise and purpose are challenged to work toward publication at the highest artistic and professional levels. We expect our graduates to become contributing citizens in the Community of Letters.

Prospective students may apply to the MA in Writing Program year-round; accepted students may begin study in the fall, spring or summer terms. Admission to the program is based on a competitive review of writing samples and other materials. The program strongly urges applicants to submit all application materials two to three months before the desired term; later applications are considered as time and course openings allow. Financial aid is provided for qualified students through student loans; many students receive employer assistance for tuition. Students complete the program part-time at their own pace—usually in two to four years. The program is not designed for full-time study, although exceptions are considered for military veterans and international students. Most students take only one or two courses per term, but some acceleration is allowed. The nine required courses include two core courses, three workshops, three electives and a final thesis course.

The full degree program in Fiction and Nonfiction is available in onsite classes at Dupont Circle in Washington, DC, and at the main Homewood campus in Baltimore. Students may take courses at either or both campuses. Our Washington / Baltimore courses are taught on weekday evenings or Saturdays; online courses are not available in Fiction and Nonfiction. However, the program offers online components of courses and uses innovative video technologies to combine students from both campuses into a single course. Onsite courses also are sometimes combined by alternating classes between DC and Baltimore each week, and/or they meet on Saturdays to ease commuting.
The Writing Program's previous Science-Medical Writing concentration has been replaced by a new MA in Science Writing and Graduate Certificate in Science Writing. (See page 190.) The remaining students in the Science-Medical Writing Concentration will have the opportunity to transfer their studies to the new MA in Science Writing. The Writing Program is not accepting new applicants for that concentration. Applicants interested in writing about science, medicine or technology should apply for any course desired.

The Writing Program sponsors readings, seminars and conferences. The program's popular summer experience, The Hopkins Conference on Craft, offers students full-course credit in an intensive, concentrated format at an off-site location. Recent conferences were held in Florence, Italy, and Bar Harbor, Maine. The 2013 conference in Baltimore included a special Medicine in Action course at world-famous Johns Hopkins Hospital, and the 2014 conference in Washington, DC, offers two courses: Science Policy, Politics, and Funding and Reading Washington: Capital Fiction and Nonfiction. The 2015 conference will be based in Shenandoah National Park and will include a science writing residency course and a general reading elective in the Writing Program. Writing Program alumni may attend the conference at discount rates, with applications also accepted from outside writers and editors. For details, see http://writing.jhu.edu/craftconference or email craftconference@jhu.edu.

THE SCIENCE-MEDICAL WRITING CONCENTRATION

The previous Science-Medical Writing Concentration in the Writing Program has been replaced by a new MA in Science Writing and Graduate Certificate in Science Writing. (See page 190.) The remaining students in the Science-Medical Writing Concentration will have the opportunity to transfer their studies to the new MA in Science Writing. The Writing Program is not accepting new applicants for that concentration. Applicants interested in writing about science, medicine or technology should apply for the new degree or certificate.

Special Note: The MA in Writing Program is the part-time alternative to The Writing Seminars, the nationally ranked, full-time graduate writing program at Johns Hopkins University. The Seminars offers a two-year, full-time Master of Fine Arts degree in fiction and poetry. The Writing Seminars offers courses only in Baltimore and has a separate curriculum and application process. For more information about the full-time program, call 410-516-6286 or visit online at http://writingseminars.jhu.edu. Prospective applicants should carefully review the admission requirements, curriculum and expectations for the desired program.

APPLICATION AND ADMISSION REQUIREMENTS

Credentials and Experience

Applicants to the Writing Program should possess some familiarity with writing in their chosen concentration, although they need not be published or professional writers. Fiction students should have read in their area of interest and explored their writing voice. Nonfiction writers should have read in their field and been exposed to some journalistic fundamentals. Applicants without such familiarity might need to take introductory courses elsewhere, or, depending on their development as writers, they might receive permission to take a core course in the program as a provisional student. (See Admission Status below)

Graduate writing students are expected to be proficient in grammar, punctuation, spelling and usage. Applications lacking this proficiency will be rejected. The program does not require a graduate entrance examination or proficiency in a foreign language. The Writing Program is not designed for students who need help with issues relating to English for Speakers of Other Languages.

Application Documents

Application materials are submitted online. See http://writing.jhu.edu. “Apply Now” for more information. On the application form, applicants must indicate the concentration in which they wish to specialize. Admission is based on a competitive evaluation of the Advanced Academic Programs (AAP) standard application materials (including an application and application fee) and the following Writing Program materials, which each applicant must submit: (Applicants should closely examine all the information below; improper or incomplete applications are major reasons for delay or rejection.)

> A Statement of Purpose, explaining the applicant's aspirations as a writer and describing the applicant's recent reading (required; see below)
> Recent writing samples in the chosen concentration, demonstrating the applicant's current development as a writer in that field (required; see below)
> Official undergraduate and graduate transcripts (required)
> Résumé or CV (required)
> Up to three recommendation letters directly relating to the applicant's experience or promise as a writer (optional)

Statement of Purpose

The Statement of Purpose should describe the applicant's education, experience and interest in the chosen writing area, and share the applicant's aspirations as a graduate student and as a writer. Statements of Purpose are reviewed for content, creativity, and interest in literary or journalistic creative writing. The statement also must describe the applicant's recent reading. The statement should not exceed three typewritten pages,
Writing Samples

The most important part of an application is the writing sample, which should be the applicant’s best attempt at creative or journalistic writing in the concentration of interest. The samples should total 20 to 40 typewritten, double-spaced pages, or about 5,000 to 10,000 words, in the concentration of interest. Samples do NOT have to be a single, lengthy piece of writing. A combination of several shorter pieces is recommended as long as the combined length of all pieces equals the requirements. For more suggestions on writing samples in each concentration, see below. Applicants may submit copies of the published equivalent (print or digital) of the above lengths, although submitted samples do not have to be published. The samples usually should be no more than five years old. Writing that is not in the chosen concentration can supplement but will not be counted in meeting the length requirements above. Academic papers, internal business reports, speeches or government documents generally are not recommended as writing samples; the samples should be creative writing, blogging or journalism in the chosen concentration. Applicants may submit uncompleted work as part of their sample as long as incomplete work is labeled. Applicants should not submit the only copy of their work; samples cannot be returned.

The program's admissions committees offer the following additional suggestions for writing samples for each concentration:

**Fiction:** Up to four short stories or novel chapters in prose fiction, or any combination of the two forms, demonstrating literary content or themes. Any style, vision, or approach is permitted — traditional, experimental, hybrid, etc.

**Nonfiction:** Up to five separate works of prose nonfiction about any subject, but demonstrating goals beyond a typical news report. Any nonfiction form or combination of forms, including feature article, commentary/blogs, memoir, travel, essay, profile, biography, book chapters and creative nonfiction is permitted. Academic assignments, term papers, government reports or scholarly criticism generally are not acceptable nonfiction writing samples.

Dual-Concentration Applicants

Applicants may seek formal degree candidacy in both Fiction and Nonfiction by submitting full writing samples in each proposed area. Such applicants should explain their multiple interest and reading in a single Statement of Purpose. The program makes individual admission decisions for each concentration in a dual-concentration application. Dual-concentration students must complete two to four more courses than the nine required for a single-concentration degree.

The Writing Seminars

Applicants are reminded that Johns Hopkins University has two graduate creative writing programs. Students interested in the MA in Writing Program should follow the application process above. Students interested in the full-time MFA program, The Writing Seminars, should follow that program’s separate application procedures. Applying to one program does not count as an application to the other. The MA in Writing Program accepts applications year-round; the Seminars accepts applications until a January deadline for a cohort class the following fall. The part-time MA program offers courses year-round in Washington and Baltimore; the full-time MFA program offers courses only in the fall and spring in Baltimore. For more information about the Seminars, call 410-516-6286 in Baltimore or link online to http://writingseminars.jhu.edu.

Admission Status

Applicants to the MA in Writing Program are either rejected or accepted as a degree candidate, provisional student or special student. (See “Student Status” in the front section of this catalog.) The Writing Program differs from other AAP graduate programs in how it handles provisional and special students: (1) Provisional students who want degree candidacy in the Writing Program must complete the provisional course or courses with a grade of A- or higher to request degree candidacy. Other AAP programs require a grade of B or higher in the provisional course(s). Provisional students should consult the program website at http://writing.jhu.edu for more information. (2) Special students in the Writing Program must get advisor permission for every course they take. (3) Unlike other AAP graduate programs, the Writing Program does not allow applicants to enroll in a program course without some type of review of writing samples and a Statement of Purpose, even if those applicants request special student or provisional status. The requirements and standards of the desired course will determine the admissions review for a request to register for that course as a special student; some courses require greater writing experience than others. Courses completed as a provisional or special student will count toward the MA degree if the student later earns degree status.

COURSE REQUIREMENTS

To earn a Master of Arts in Writing in Fiction or Nonfiction, students must complete the following nine onsite courses:

- Two core courses: Contemporary American Writers and the appropriate Techniques course
- Three writing workshops in the chosen concentration (core courses usually must be completed before enrolling in a workshop)
- Three electives, approved by an advisor (At least one elective must be exclusively in the student's concentration)
- The thesis course (all eight earlier courses must be completed before starting the thesis course)
For the Writing Program thesis, students submit highly revised versions of writing selected from their work in earlier courses. Core courses, workshops and electives are described below.

COURSES

Writing courses are open only to program students who have submitted appropriate writing samples and received a formal admissions decision from the Writing Program. Please refer to each semester's Course Schedule (writing.jhu.edu or in the ISIS Registration System) for exact dates, times, locations, fees and instructors for that term's courses. Only a selection of courses from the curriculum is offered each term, although core and required courses are offered more often than electives and specialized workshops. Some electives are offered only every year or two. Students may enroll in one or two courses per term; more than that requires special permission. Those who take two courses per term usually pair two core courses, or a workshop and an elective, until reaching thesis. Students may enroll in only one workshop course per term. Students usually have five years to complete their degree and should consult the policies and guidelines in the front of this catalog concerning Continuation of Enrollment, Time Limitation and Leave of Absence.

Note to Students from Outside the MA in Writing Program: The program encourages enrollment from students in other Johns Hopkins University graduate programs. However, non-program applicants should be aware that all writing workshops and some other courses require the completion or waiver of certain prerequisite core courses, or they require an evaluation of the student's writing skills to determine whether he or she qualifies for the desired course. Non-Writing Program students may be asked to submit writing samples and/or a full description of their writing experience before being allowed to register for certain courses.

CORE COURSES

Core courses provide foundation skills and theory in each concentration. Fiction and Nonfiction students should complete both of their concentration's core courses before enrolling in a workshop, although they may take an elective at any time. The core courses for Fiction students are 490.652 Contemporary American Writers and 490.654 Fiction Techniques. The Nonfiction core courses are 490.656 Nonfiction Techniques and 490.652 Contemporary American Writers. To improve foundation skills, Nonfiction students should consider 490.703 Principles of Journalism as an additional core course or elective. (In some cases, Fiction and Nonfiction students may seek permission to enroll in a workshop after completing the appropriate Techniques course; advisor approval is required.)

Waiver of a Core Course

Some accomplished writers may seek a waiver of the Techniques course requirement in their concentration. Such students must submit a written request to the program director or assistant director explaining how they have previously acquired the appropriate foundation skills. For example, applicants with numerous publication credits, extensive professional experience or an undergraduate degree in their concentration may decide to request a Techniques waiver. If a waiver is granted, the student must replace the waived course with an additional workshop or elective. Waivers are rarely granted in Fiction; waiver requests are more common from practicing journalists who apply in Nonfiction. Waiver requests should be submitted at least a month before the term starts, if possible.

WORKSHOPS

Workshops are the most important courses in the Writing Program curriculum. They allow students to create and revise their own writing in an intensive group critique process. All courses that count as a workshop for degree requirements include the word "workshop" in their title unless special permission is given, courses without the word "workshop" in their title cannot count as a workshop toward degree requirements. Some workshops are general workshops, in which students may submit writing of any form or style within the specified concentration: Fiction Workshop or Nonfiction Workshop. Other workshops are specialized, meaning students must submit writing in a certain form or style within the concentration: Writing the Novel Workshop, Writing the Memoir & Personal Essay Workshop, Experimental Fiction Workshop, Profile & Biography Workshop, Travel Writing Workshop, etc. Any workshop counts toward the requirement of three workshops for a degree. To meet the requirement of three workshops, students may take the same workshop multiple times, or they may take any combination of general or specialized workshops.

Unless a core course waiver has been granted or special permission is received, students in Fiction and Nonfiction must complete the appropriate core courses before enrolling in any writing workshop. Students are encouraged but not required to take each of their three writing workshops from a different instructor.

Special Note: Students should not take more than one workshop per semester, and no student may take a writing workshop or other intensive writing course outside the chosen concentration without the permission of the program director or assistant director. Additional writing samples or the completion of core courses may be required before such permission is granted; the non-concentration workshop will count as an elective.

Please note the university uses three course numbers for general workshops in a given concentration. These numbers distinguish between the offerings in the three terms of an academic year; they do not indicate that workshops are sequential or that students need to take workshops with a different number to meet degree requirements. Because the numbering scheme is repeated every year, it is conceivable that a student's three completed general workshops will have the same course number.
The Writing Program is developing special courses that offer either workshop or reading elective credit to students enrolled in a single, combined course. See 490.668 on page 195. The program also is developing workshops that enroll both concentrations in the same course.

**ELECTIVE COURSES**

The Writing Program offers three types of electives: reading electives, craft electives and cross-concentration electives. Reading electives are literature courses that involve craft-based analysis and discussion of intensive reading assignments, with few writing requirements. Craft electives focus on special issues of technique, such as voice or structure, and may involve extensive reading plus some writing exercises and assignments. Cross-concentration electives are courses that are open to students of both concentrations and require comparative reading, exercises and analysis.

Students usually can take electives at any time, even if they have not completed the required core courses. However, students are strongly urged to complete both core courses as soon as possible, so they have the option of taking a workshop and/or elective in subsequent terms.

Writing Program students usually must complete three electives to earn their degrees, although additional workshops may count as electives. At least one of those electives must be specifically within the students concentration. Students should consult the course descriptions below for information on electives designed for their chosen concentration. Generally, electives numbered 490.678, 490.680, 490.683, 490.684, 490.687, 490.88, 490.713, 490.721, and 490.731 are designed for Fiction students. Electives 490.689, 490.699, and 490.703–05 are meant for Nonfiction writers. Other electives (490.676–677, 490.686, 490.702, 490.711–12, 490.714, 490.719–20, and 490.800) are designed for students from any concentration. With an advisor’s approval, students may take electives outside their chosen concentration. Depending on their background, students may be asked to submit appropriate writing samples for the new concentration before they are allowed to register.

Students should carefully plan their studies to include their top choices for elective courses. Electives are offered on a rotating basis; some are scheduled only every two or three years. While students generally register on a first-come, first-served basis, students within a concentration may, at the program’s discretion, be granted enrollment priority when registering for required or elective courses within that concentration. New electives may be offered at any time.

**THESIS**

Students enroll in the Writing Program’s final thesis course only after completion of all core courses, workshops and electives required for the M.A. in Writing. All thesis students should submit a Thesis Planning Form at least one month before taking the course. For more information about the thesis course and thesis process, see Program Resources at the Writing Program website at writing.jhu.edu. A Writing Program thesis is based on work created and revised in previous courses.

**SCIENCE WRITING COURSES FOR MA IN WRITING STUDENTS**

Students in the MA in Writing Program also can consider earning electives through the MA in Science Writing Program. For instance, Nonfiction students might consider a Science Writing Workshop or a Science Writing reading course. All regular Science Writing courses are offered fully online; the MA in Writing Program does not offer online courses in Fiction or Nonfiction. For more information about Science Writing, see page 190. The following Science Writing courses may be of interest to MA in Writing Program students:

- 490.658 Techniques of Science-Medical Writing
- 490.750 Contemporary Science Writing: Creative and Professional Forms
- 490.673, 490.674, 490.675 Science-Medical Writing Workshop
- 490.696 The Nature of Nature
- 490.697 The Literature of Science
- 490.707 Prize Winners: The Best Writing About Science, Technology, Environment, & Health
Science Writing

Master of Arts in Science Writing and Graduate Certificate in Science Writing
MA degree online with one residency; certificate fully online (Also see Writing, page 185).

FROM A FLOWER'S DELICATE PETAL TO MYSTERIES OF A DISTANT GALAXY, SCIENCE WRITING EXPLORES AND EXPLAINS HOW OUR WORLD WORKS. THE BEST SCIENCE WRITING INSPIRES DEEPER UNDERSTANDING, A SENSE OF WONDER OR A NEED TO ACT. THE ONLINE / LOW-RESIDENCY SCIENCE WRITING PROGRAM AT JOHNS HOPKINS STRIVES TO GUIDE THE NEXT GENERATION OF WRITERS AND EDITORS WHO WILL HELP THE PUBLIC COMPREHEND THE INCREASINGLY COMPLEX ISSUES OF SCIENCE, MEDICINE, AND TECHNOLOGY THAT AFFECT THEIR LIVES. STUDENTS CHOOSE FROM A NINE-COURSE MASTER OF ARTS OR A FIVE-COURSE GRADUATE CERTIFICATE. ELIGIBLE APPLICANTS MAY TAKE ONLY A COURSE OR TWO OF SPECIAL INTEREST AS NON-DEGREE STUDENTS. A BRIEF RESIDENCY COURSE, REQUIRED FOR THE DEGREE AND OPTIONAL FOR THE CERTIFICATE, PROVIDES INTENSIVE FACE-TO-FACE STUDY TO COMPLEMENT THE GROUP AND PERSONAL INTERACTION OF ONLINE COURSES.

The program recognizes that contemporary science writing involves journalism, communication, multimedia, and the literary arts. Our typical student hones journalistic and creative writing techniques to craft enticing, understandable prose for digital or print venues, from magazines and books to social media and websites for companies, associations, agencies or others. Along the way, students acquire communication skills to promote viewpoints and develop technology expertise to thrive in the digital universe. Our writers and editors also are challenged to monitor science itself, to disclose how research can falter or be misused.

Hopkins Science Writing students have visited a research island in Maine, control rooms at NASA, historic museums in Italy, and world-famous genetics and biotech labs in Washington and Baltimore. They have observed surgeons in the operating room, sailed with biologists on the Chesapeake Bay, heard from Nobel and Pulitzer winners, and met with science writers from The Washington Post, New York Times, National Public Radio, National Geographic, Discover, Science, Nature, and other publications. From space and the oceans to nanotechnology and climate change, from cell phones and robots to fitness and genetics, the ever-changing topics chosen by our science writers are essential to an enlightened citizenry of the 21st Century.

Students in the Science Writing Program do not focus on creating scientific research reports, journal articles for peer review, or other scholarly/academic constructs, nor do we teach technical writing for instruction manuals or complicated textbooks. Our curriculum also is not designed to help scientists or others who need remedial help or instruction in English as a Second Language. While the program may offer individual courses in those areas, our Science Writing students aim to translate the complicated information and trends of science, medicine and technology into meaningful, perceptive prose for a broad audience.

HOPKINS SCIENCE WRITING: A LONG HISTORY — While Johns Hopkins recently discontinued its full-time graduate program in science writing, our program remains open and thriving in its 23rd year. After two decades of onsite courses in Washington and Baltimore, the program has expanded to a national and international audience through the new online / low-residency format and a new, separate Master’s Degree and Graduate Certificate.

Program Committee

Brad Leithauser
Chair, MA and Graduate Certificate in Science Writing; Professor, The Writing Seminars

David Everett
Director, MA in Writing Program

Melissa Hendricks Joyce
Coordinator, MA and Graduate Certificate in Science Writing

Ruth Levy Guyer
Author, Science Writer, Faculty Member, MA in Writing Program

Kay Redfield Jamison
Author, Professor of Psychiatry, Johns Hopkins School of Medicine

Diana Sugg
Medical Writer, Freelance Writer
APPLICATION AND ADMISSION REQUIREMENTS

Credentials and Experience
Applicants to the Science Writing Program should possess some familiarity with reading and writing in the field, although they need not be published or professional writers. A background in science is useful but not required. Some applicants might receive permission to take a program core course or two as a Provisional Student. (See Admission Status below.)

Graduate writing students are expected to be proficient in grammar, punctuation, spelling and usage. Applications lacking this proficiency will be rejected. The program does not require a graduate entrance examination or proficiency in a foreign language.

Application Documents
Application materials are submitted online. See http://advanced.jhu.edu/sciencewriting/ “Apply Now” for more information. Admission is based on a competitive evaluation of the Advanced Academic Programs (AAP) standard application materials (including an application and application fee) and the following Science Writing Program materials, which each applicant must submit: (Applicants should closely examine the information below; improper or incomplete applications are major reasons for delay or rejection.)

- A Statement of Purpose, explaining the applicant’s aspirations as a writer and describing the applicant’s recent reading (required; see below)
- Recent writing samples, including some works of science writing, demonstrating the applicant’s current development as a writer (required; see below)
- Official undergraduate and graduate transcripts (required)
- Résumé or CV (required)
- Up to three recommendation letters directly relating to the applicant’s experience or promise as a writer (optional)

Statement of Purpose
The Statement of Purpose should describe the applicant’s education, experience and interest in writing and share the applicant’s aspirations as a graduate student and as a writer about science, medicine, or technology. Statements of Purpose are reviewed for content, creativity, and interest. The statement also must describe the applicant’s recent reading. The statement should not exceed three typewritten pages, single- or double-spaced. The Statement should specify whether the applicant seeks the degree or certificate, or permission to take only a specific course or two. The desired course(s) should be listed.

Writing Samples
The most important part of an application is the writing sample, which should be the applicant’s best attempt at creative or journalistic writing. The samples should total 20 to 40 typewritten, double-spaced pages, or about 5,000 to 10,000 words, but samples do NOT have to be a single, lengthy piece of writing. A combination of several shorter pieces is recommended if the combined length of all pieces equals the requirements. Applicants lacking samples about science, medicine or technology may submit writing about other topics; any type of explanatory writing is especially appreciated. The samples themselves should be up to five separate works of prose. Any factual form or combination of forms, including news or feature article, commentary/blogs, memoir, travel, essay, review, profile, book chapters and creative nonfiction, is permitted. Applicants may submit copies of the published equivalent (print or digital) of the above lengths, although submitted samples do not have to be published. Applicants with digital writing samples should submit the entire sample, not just a link. The samples usually should be no more than five years old. Academic papers, peer-reviewed research reports, technical writing or government documents generally are not recommended as writing samples; the samples should be journalism, communication writing, creative writing, blogging, etc. Applicants may submit uncompleted work if they label it as such. Applicants should not submit the only copy of their work; samples cannot be returned.

Admission Status
Applicants to the Science Writing Program are reviewed by an Admissions Committee of program leadership and faculty. Applicants are either rejected or accepted as an MA or Certificate candidate, Provisional Student or Special Student. (See “Student Status” in the front section of this catalog.)

Earning Provisional Student and Special Student status in the Science Writing Program does not eliminate the need to undergo a full admissions review when requesting MA or Certificate candidacy. Additionally, the Science Writing Program differs from other AAP graduate programs in the handling of Provisional and Special Students: (1) Provisional Students who want MA or Certificate candidacy in Science Writing must complete the provisional course or courses with a grade of A- or higher to request degree candidacy. Other AAP programs require a grade of B or higher in the provisional course(s). Provisional Students should consult the program website at http://advanced.jhu.edu/sciencewriting for more information. (2) Special Students in Science Writing must get advisor permission for every course they take. (3) Unlike other AAP graduate programs, Science Writing does not allow applicants to enroll in a course without some type of review of writing samples and a Statement of Purpose, even if those applicants request Special Student or Provisional status. The requirements and standards of the desired course will determine the admissions review; some courses require greater writing experience than others. Courses completed as a Provisional or Special Student will count toward the MA or Graduate Certificate if the student later earns formal candidacy.

COURSE REQUIREMENTS

Our curriculum starts with core courses that focus on fundamental skills in reporting and writing and broad
understanding of contemporary science writing forms. Students then enroll in workshops and electives, with internships and Independent Studies available under certain circumstances. In writing workshops, students submit their own writing and revisions for peer review and editing. Electives usually focus on reading-as-a-writer skills or specific forms or topics such as nature writing or literary science writing. Certificate and MA students take the same courses. The MA in Science Writing requires an onsite Residency course; a Residency course is optional for Certificate students. The degree program concludes with a capstone thesis course in which students revise a portfolio of their best, most publishable work produced in earlier courses and prepare a formal career plan for success in the field.

**Master of Arts in Science Writing**

(9 courses, including a Residency and thesis.)

1. Techniques of Science-Medical Writing (online core course)
2. Contemporary Science-Medical Writing: Creative and Professional Forms (online core course)
3. Four Science Writing Workshops (online; can be any course with Workshop in title)
4. Two electives, approved by advisor (online)
5. One Residency course (onsite; location and topics)
6. One Student Choice: Another workshop, elective, Residency, course in another AAP Program*, or an internship or Independent Study
7. Thesis and Careers in Science Writing (online; final course)

**Graduate Certificate in Science Writing**

(5 courses, Residency optional)

1. Techniques of Science Writing (online core course)
2. One Science Writing Workshop (online)
3. One elective, approved by advisor (online)
4. Two Student Choice courses: The second core course, a Residency, another workshop or elective, an internship or Independent Study, or, if approved, a course in another AAP Program*

* Select courses available from AAP programs in Communication, Biotechnology, Environmental Sciences and Policy, and Government. With special permission, students also may consider other Hopkins courses in science, medicine, or Public Health. Science Writing students pay the tuition charged by the offering program.

Degree and Certificate students should take Techniques of Science Writing first, if possible, and should complete that course before enrolling in a workshop or Residency. Exceptions can be granted to this guideline with advisor approval. Some experienced journalists or writers will be allowed to replace one or both core courses with other courses, as approved. Students usually take one or two courses per term, and they may take one or two terms off as personal schedules require. Thesis and Careers in Science Writing should be taken in the last term of studies. Degree students have five years to finish the nine courses; extensions and leaves of absence are possible.

**Note:** Under AAP guidelines, only three Certificate courses can count toward the MA in Science Writing. Certificate students who become interested in the MA degree should declare their interest early to avoid the need to complete extra courses.

**RESIDENCIES**

Degreecandidates in Science Writing must complete at least one course through an onsite Residency; a Residency is optional for Graduate Certificate students. Master's degree students who want more face-to-face interaction can take a second Residency with advisor approval. The program plans to offer at least one Residency course per year, with two possible in upcoming years. While new Residencies are being developed, they include so far:

**Medicine in Action at Johns Hopkins Hospital:** A week inside the world-famous hospital in Baltimore to experience the front lines of contemporary medical care and research. This residency in 2013 included sessions with winners of the Nobel and Pulitzer prizes.

**Science Policy, Politics, and Funding in Washington, DC:**
A week focusing on federal research, policy, and regulation, plus the interaction of the scientific community with government. Students meet with science writers and visit Capitol Hill, federal agencies, and association offices in and around Washington.

**Science in Action:** This Washington, DC, and Baltimore course spotlights active research at NASA, National Institutes of Health, National Institute of Standards and Technology and the Howard Hughes Medical Institute, plus federal agencies such as EPA, Energy and Homeland Security — and Hopkins labs in space exploration, nanotechnology and the famed Applied Physics Laboratory.

Shenandoah National Park: A Mountain Immersion: Writers explore the nature, conservation, and land use and other environmental issues of Virginia's Blue Ridge Mountains. Nature walks, field excursions, visits with naturalists, and participatory reporting provide inspiration for student writing. (Scheduled for 2015)

**Florence, Italy, and Bar Harbor, Maine:** The sites of previous summer writing conferences for the MA in Writing Program, Florence and Bar Harbor are being considered for future Science Writing Residencies if financing can be arranged. In 2012, Science Writing students spent ten days covering coastal research in Maine as part of the In the Field course. The Florence sessions focused on the history of science at the famous city’s many world-class science museums and scientific historic sites. The Italy and Maine options are uncertain at this time.
For Residencies, Science-Medical Writing students pay a regular course tuition, plus travel and lodging; discount housing usually is available. A Residency course tuition is the same as any other course in the Science Writing Program, plus a Residency/conference fee of $150-500, depending on location and activities.

Online Learning

The Science Writing Program exploits the best of onsite and online learning. Our online courses include the one-on-one help that defines many low-residency graduate writing programs, plus the group interaction that many low-res programs lack. In effect, our online courses combine individual help with a digital classroom experience involving other students. Students are trained in online learning and benefit from 24/7 technical help.

The primary platform for digital courses is a special, customized version of Blackboard, one of the nation’s major online education systems. However, instructors use a range of other tools in and outside each Blackboard course, including Adobe Connect, Skype, video, audio, email, wikis, Twitter, and Facebook. Our online courses feature several components:

Asynchronous Units: Most work in an online course is completed through a series of units that students complete on their own time and convenience during the semester, without the need to show up at a certain time and day each week. Students login to their course, complete assignments or do other work, and engage with others over several days, a week, or more – whatever amount of time the instructor has assigned. Each unit involves specific assignments and goals reached through a range of learning tools, including readings, exercises, video lectures, writing or reporting assignments, demonstrations, or asynchronous discussions with other students. The instructor is available for questions and feedback as students finish the unit amid their individual schedules and across multiple time zones.

Individual Help: The instructor provides frequent one-on-one feedback and communication with students. This feedback may include assessment of a student’s work, especially for writing assignments and revision. The communication can occur by email, direct messages, private journaling, phone calls, and written comments and editing directly on a student’s writing. Online instructors also schedule individual or group appointments and hold email or video office hours.

Synchronous Discussion and Meetings: At times, students join live, synchronous discussions with fellow students and their instructor. Such synchronous discussions can occur in the course’s Blackboard site or using Skype, Adobe Connect or other methods – audio or video. These opportunities occur less often than asynchronous unit work and are announced well in advance so students can arrange to attend. Students who cannot attend will be able to monitor recordings of the sessions.

A Program Community: In addition to each course’s digital features, Science Writing students join broader, program-wide discussion groups, meetings, and networking. These may include chat rooms, Facebook pages, job postings, information exchanges, and private discussions.
Writing Course Descriptions
Writing and Science Writing

NON-GRADUATE COURSE

490.010 Graduate Writing Techniques
This non-credit course is designed for students in the Advanced Academic Programs or others who want to improve their general academic and workplace writing skills. The 20-hour course focuses on techniques that can be applied to classroom papers, reports, and theses, or to workplace projects and documents. The course features exercises in structure, language, usage, and form. Students critique each other's work in a writing workshop, and some students may be able to submit writing from courses in other programs. This course is not a creative writing workshop and is not designed for students who need help with English as a second language. This course is designed primarily for students from outside the M.A. in Writing Program. At publication time for this directory, the program was considering changes to or the possible elimination of this course.

CORE COURSES

490.652 Contemporary American Writers
This course surveys issues and trends in recent fiction and nonfiction, with emphasis on the diverse work and methods of American writers publishing today. Students read and discuss contemporary writing and hear from Writing Seminars faculty or other accomplished writers. This course focuses on developing skills to read as a writer, and it explores the similarities and differences between factual and nonfactual writing, including the roles of truth, accuracy, and reader expectation. This core course is required for all incoming fiction and nonfiction students and usually must be completed before students in those concentrations enroll in a writing workshop. This course replaces Contemporary Nonfiction as one of two nonfiction core courses.

490.654 Fiction Techniques
Students examine in depth the elements of fiction, including point of view, plot, character development, and the forms of short stories and the novel. The course also introduces students to the writing process, the techniques of reading as a writer, and the workshop process. Readings usually include short stories, one or more novels, and books or articles on craft. Writing assignments may involve exercises, response writings, and one complete piece, either an original short story or novel chapter. Revisions also may be required. This core course is required for all incoming fiction students as a prerequisite to any workshop. Others may take it as an elective, although the program may limit the number of registrants from outside Fiction.

490.655 Poetry Techniques
This course offers an introduction to prosody and the technical elements of poetry with an emphasis on structural principles, metrical and syntactical rhythm, sound and rhyme, formal and stanzaic organization, and the use of figurative language. Students read and write poems exploring lyrical, narrative, and dramatic subjects. Writing assignments include exercises, imitations, responses, and original work.

490.656 Nonfiction Techniques
The intensive reading and writing exercises of this course help students gather information and transform it into clear, creative prose – whether in literary essay and memoir or journalistic forms such as articles, reviews, or opinion. Reporting techniques include interviewing, personal observation, and examining documents. Writing techniques include structure, quotation, detail, word choice, transition, and revision. This core course is required for all incoming Nonfiction students prior to enrolling in a workshop. Students in Fiction may consider this course as an elective.

490.658 Techniques of Science-Medical Writing
This core course develops and hones the reporting, creative, and explanatory skills demonstrated by the best science-medical writers. The course features writing assignments and exercises in journalistic and literary writing, plus interviewing, ethics, and the use of scientific journals and databases. In some cases, students may be able to choose from a range of writing topics, including nature, technology, health, space, biology, medicine, or other technical or scientific issues. Science Writing students should complete this course before enrolling in any writing workshop. Enrollment is encouraged by other students interested in this growing professional and creative field.

490.659 Advanced Reporting & Writing in Science
This new course provides advanced development of reporting and writing skills for science writers, continuing beyond the foundation of 490.658 Techniques of Science-Medical Writing. This course covers a range of sophisticated techniques, including computer-assisted research, in-depth interviewing, and the use of science and medical databases and studies. Forms include science essay, investigative writing, and opinion writing. Students will write a longer essay, article, or column for this course. Prerequisite: Techniques of Science-Medical Writing.

490.660 Fiction Workshop
Fiction Workshops concentrate on intensive writing and revision, with some required reading. As members of a general workshop, students submit short stories or novel chapters
to their instructor and peers for critiques. Typically, two or three stories or chapters are submitted during a semester; revisions are usually required. Workshop participants also submit detailed critiques of their fellow students’ writing. We recommend, but do not require, that students take at least one general workshop before progressing to more specialized workshops, and we urge students to take workshops from different instructors. Students may take Fiction Workshop up to three times, although specialized workshops also can count toward the requirement of three workshops for a master’s degree. (See Writing the Novel Workshop).

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Fiction Workshops concentrate on intensive writing and revision, with some required reading. As members of a general workshop, students submit short stories or novel chapters to their instructor and peers for critiques. Typically, two or three stories or chapters are submitted during a semester; revisions are usually required. Workshop participants also submit detailed critiques of their fellow students’ writing. We recommend, but do not require, that students take at least one general workshop before progressing to more specialized workshops, and we urge students to take workshops from different instructors. Students may take Fiction Workshop up to three times, although specialized workshops also can count toward the requirement of three workshops for a master’s degree. (See Writing the Novel Workshop.)

490.663 Poetry Workshop
These general workshops provide an intensive writing experience in conjunction with appropriate reading. As members of a workshop, students submit poems to their instructor and to their peers for weekly critique sessions. Students are expected to spend their time generating new poems and revising others.

490.666 Combined Workshop & Readings in Science-Medical Writing
This innovative new course allows students to earn either workshop or elective credit in Science-Medical Writing, in a single, combined course. Students seeking workshop credit submit writing in the usual manner; enrollees needing elective credit will complete extensive reading and exercises. At times, all students will engage together in workshop discussion or reading analysis. At other times, the two groups might separate for special attention to reading or the workshop. Students must complete Techniques of Science-Medical Writing or Nonfiction Techniques before enrolling in this course. (Registration Note: Science-Medical Writing students may enroll in this course if they need either workshop or elective credit toward their degree.)

490.667 Combined Workshop and Readings in Fiction
This challenging course allows students to earn either Fiction Workshop credit or a Fiction reading elective credit in a single, combined course. Students seeking workshop credit will submit fiction in the usual manner. Students needing elective credit will complete extensive fiction reading and exercises. At times, all students will engage together in workshop discussion or reading analysis. At other times, the two groups might separate for special attention to reading or the workshop. The dual goal is to provide Fiction elective students with workshop experience as they earn reading course credit, while workshop students will enjoy the full writing critique process while also completing helpful reading along the way. Students must complete Fiction Techniques before enrolling in this course. (Registration note: Fiction students may enroll in this course if they need either workshop or elective credit.)

490.668 Combined Workshop and Readings in Nonfiction
The innovative experience allows students to earn either Nonfiction Workshop credit or a Nonfiction reading elective credit in a single, combined course. Students seeking workshop credit will submit nonfiction in the usual manner; enrollees needing elective credit will complete extensive reading and exercises in factual writing. At times, all students will engage together in workshop discussion or reading analysis. At other times, the two groups might separate for special attention to reading or the workshop. The dual goal is to provide Nonfiction elective students with workshop experience as they earn reading course credit, while workshop students will enjoy the full writing critique process while also completing helpful readings along the way. Students must complete Nonfiction Techniques before enrolling in this course. (Registration note: Nonfiction students may enroll in this course if they need either workshop or elective credit.)

490.669 Combined Workshop in Nonfiction and Fiction
This course allows students in nonfiction and fiction to earn a workshop credit in the same class. Students in both concentrations and from either Washington or Baltimore are urged to enroll. In most cases, this course will have a separate instructor in each concentration who will form smaller workshop groups. Those groups will then workshop material in innovative ways, including digital discussion, video conferencing, phone conferencing, or one-on-one discussion with the instructor. These workshops groups will usually not meet each week at a set day and time, making this course more flexible and convenient to students from different campuses. Students need advisor permission to enroll in this course.

490.670 Nonfiction Workshop
These general workshops give students extensive experience in writing and revising their factual work, regardless of topic
or form. Submissions are critiqued by peers as well as by the instructor. Students typically submit two to four essays, articles, or book chapters; revisions are required. Reading and writing exercises also may be required. Students may take this workshop up to three times to meet the workshop requirement for a master’s degree, although specialized workshops also meet that requirement.

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490.676 Sentence Power: From Craft to Art
This craft elective focuses on revision at the sentence and paragraph level and is open to students of all concentrations. Through close reading and brief exercises, students learn various techniques to assemble sentences and establish syntactic relationships within paragraphs. Students imitate other writers, as well as revise, exchange, and discuss paragraphs or stanzas from their own work. Authors to be studied may include Updike, Munro, and Welty in fiction; Dillard, Maclean, and Mitchell in nonfiction; Brodsky, Hecht, and Bishop in poetry; and Thomas, McPhee, and Quammen in science and nature.

490.677 Shakespeare: Art and Audience
This reading elective focuses on Shakespeare’s ability to create art of the highest quality while remaining entertaining to large audiences – a goal that has proved elusive to many of today’s writers. Students analyze how Shakespeare created dramatic and poetic traditions and was instrumental in shaping current prose fiction. The course involves reading, discussing, and possibly attending plays, as well as critical and creative writing options. This course may be offered in conjunction with festivals or other productions of Shakespeare’s work.

490.678 Novel Form, Style, & Structure
This craft elective is meant primarily for fiction writers, especially those writing or wishing to write a novel. Others, however, might find it of interest. The course focuses on a writer’s analysis of novels, expanding the study of fiction into techniques and issues relating to the longer form. Topics include structure, character arcs, style, consistency of voice, techniques of backstory, and plot management. Class assignments may include response writings and original fiction as well as oral presentations. Readings usually include a number of novels, plus books or essays on novel craft.

490.679 Experimental Fiction Workshop
This specialized workshop introduces students to innovative forms and approaches in non-traditional or experimental fiction. It is designed for students who write, or wish to write, experimental fiction, and for students who generally write more traditional fiction but would like to stretch the boundaries of their work. Assignments challenge students to experiment with styles that differ from their previous work; extensive reading assignments come from the latest collections. The course generally follows a format similar to that of 490.660 Fiction Workshop, although readings and exercises take precedence during the first few weeks. The course is open to fiction students who have completed the fiction core courses. This course counts as one of the required three workshops for earning a master’s degree in fiction.

490.680 20th Century World Literature
In this fiction reading course, stories or novels from such authors as Kafka, Beckett, Waugh, Marquez, Malamud, Coetzee, and Tanizaki are used to explain how different cultures may have different literary traditions but how the mechanisms of good writing are universal. Class assignments may include response writings and original fiction as well as oral presentations. While this elective may still be offered from time to time, its content is now included in 490.702 Readings in Global Fact and Fiction.

490.681 The Craft of Poetry: A Reading & Writing Workshop
This course offers intensive study in poetry techniques, readings, and workshop. Poetry students who enroll earn full course credit for a core course, elective, or workshop, as needed. Content of this course will be targeted to the needs of students who enroll and to the strengths of differing instructors. Some students may focus on workshop discussion of their poetry, while others may focus on reading or discussion. Some may choose both goals. To learn more about poetry, Fiction or Nonfiction students may take this course as an elective.

490.682 Writing the Novel Workshop
This specialized workshop is designed for students who are writing a novel. Students must submit a total of 40-75 pages of a novel in progress, plus a synopsis. Revisions also may be required. Included are readings and discussions on the particular demands of longer fiction. Prerequisite: Fiction Workshop, or permission of the program fiction advisor. (Enrollees also must have completed or waived the fiction core courses.)

490.683 Voice In Modern Fiction
This course explores how fiction writers create their own personality on the page, leading students to develop and refine their own writing voices. Students will consider how style, point of view, tone, word choice, structure, and culture all contribute...
to an author's or narrator's individual voice. In recognizing how authors use these elements, students engage in exercises to strengthen their own writers' voices. Readings include novels, short stories, and other fictional work, as well as articles on craft. Class assignments may include response writings and original fiction as well as oral presentations.

490.684  The Heritage of Fiction I & II
This reading course examines the historical development of fiction craft, emphasizing the interrelationship of social and cultural development with the maturation of writing. Students learn to appreciate how contemporary authors have roots in the fiction of the past, and how they themselves might be inspired by those who came before them. The course requires extensive reading as well as creative and critical writing. Section I examines fiction before the 20th century; Section II examines the 20th century. Either section may be taken, and neither has to be taken in order.

490.686  Identity In Contemporary Writing
This cross-concentration reading elective explores how personal identity is transformed into fiction, poetry, and essays. Writers studied include those whose race, class, gender, ethnicity, sexual orientation, or disability figure prominently in their work, as well as writers who ignore or dismiss such categorization. Students may be asked to write responses, creative pieces, craft analyses, or essays for discussion by the class. This course should be of interest to students of any concentration.

490.687  The Short Story: Past & Present
This fiction reading elective begins with a brief review of the history and development of short fiction, moving to analysis of contemporary forms, trends, and practitioners. Featured authors may include Chekhov, Carver, Paley, Barthelme, Munro, and Dixon. The course focuses on intense reading, analysis, and discussion more than writing assignments. Students also may be asked to make class presentations and to review a range of literary journals.

490.688  The Evolution of Fiction Forms
This reading/craft elective examines the formative genres of fiction. Students will read examples of romance, confession, anatomy, and novel and consider contemporary fiction in terms of these historical trends. The readings will range from ancient Egyptian tales and Greek romances to typically misplaced 19th century works such as Flaubert's The Legend of St. Julian the Hospitaller and Robert Louis Stevenson's The Strange Case of Dr. Jekyll and Mr. Hyde. Colette, Camus, Julian Barnes, Stephen Dixon, and Lucy Ellmann also may be included in the reading. Students will respond to the readings with fictional pastiches reflecting the forms under study, culminating in a final hybridized project.

490.689  Masters Of Nonfiction
This reading elective allows students to analyze and discuss contemporary nonfiction and science-medical writing without the additional requirement of extensive writing assignments. While students write brief reviews and make a class presentation, the course largely involves reading and discussing such masters of the genre as McPhee, Wolfe, Didion, Talese, Kidder, and others. Extensive reading is required, and students should be prepared for significant class participation. This course is designed primarily for students in nonfiction and science-medical writing; fiction writers and poets also may find it of interest. The goal of the course is to develop reading and craft-analysis skills that will help writers grow throughout their lives.

490.690  Travel Writing Workshop
The best travel writers weave a rich “sense of place”—a trait also crucial to literary fiction, memoir, and creative nonfiction. The telling detail, apt metaphor, historical reference, cultural connection, and vivid character sketch, coupled with reflections that link these observations to broader themes, can elevate travel writing beyond the guidebook. In this specialized workshop, students complete exercises, hear guest speakers, and analyze the works of acclaimed writers such as Jan Morris, Barry Lopez, Ian Frazier, and Jonathan Raban. Students may be asked to visit an assigned nearby location to prepare writing. This workshop is intended for nonfiction and science-medical writing students and counts as a writing workshop. (Enrollees must have completed or waived nonfiction core courses.) Students in fiction or poetry may enroll with the permission of the program director or assistant director.

490.692  Profile and Biography Workshop
Articles or books about people are a central component of contemporary nonfiction and medical writing. In this specialized workshop, students examine methods used in profile articles, biographies, and, to a lesser extent, fictionalized biographical accounts. Students usually write two or three profiles or biography chapters in this course, plus revisions. This course is open to nonfiction and science-medical writing students who have completed or waived both core courses in their concentrations.

490.693  Writing Memoir & Personal Essay Workshop
Writers have long enjoyed a major impact on contemporary thought by producing compelling essays about personal experiences, feelings, or ideas. In this specialized workshop, students experiment with memoir and the personal essay as distinct forms and as an exploration of the self. Seminal essays are read to clarify students' thoughts and to help them develop their own voice and style in personal nonfiction. This course is open to nonfiction and science-medical writing students who have completed or waived both core courses in their concentrations.

490.694  Government & Political Writing Workshop
As the center of American government, Washington also is the capital of writing about government and politics. Students in this specialized workshop are introduced to the substantive topics and technical specifics necessary to report and write on government and politics. Students are asked to analyze, explain and write about events as they occur in Congress, the White House and elsewhere in the capital. Guest lecturers provide insights into their craft. This course is open to Nonfiction and Science-Medical Writing students who have completed core courses in their concentrations.
490.695 Viewpoint Journalism Workshop
This specialized workshop in nonfiction and science-medical writing combines extensive reading and writing in the area of opinion. Students explore the conventions governing effective editorials, personal columns, first-person writing, and other kinds of commentary. Specialists from different areas discuss their craft in guest lectures. This workshop is open to students who have completed or waived the nonfiction and science-medical writing core courses.

490.698 Writing the Review Workshop
This specialized workshop focuses on writing reviews. Students learn that reviews and criticism require special writing skills and detailed knowledge. Students read and write reviews of various entertainment and art, including books, films, plays, television, and music. Students might be asked to attend films, concerts, and plays, or to critique certain books and recordings. This course is not focused on literary criticism. It is designed for nonfiction and science-medical writing students who have completed or waived core requirements; fiction or poetry students may enroll with the permission of the program director or assistant director.

490.699 Magazine Style and Substance
This reading and craft elective course is designed for nonfiction and science-medical writers. To improve as writers and learn about markets, students read, study, and discuss a range of contemporary mass-market magazines and magazine writing in print and online. Students write brief reports and deliver presentations, although the course involves a minimum of writing and a maximum of reading. Students focus on magazines such as The Atlantic Monthly, Salon, Discover, Harper’s, The New Yorker, Slate, Outside, Vanity Fair, Rolling Stone, and Wired, as well as less-prominent digital and print publications. This course generally does not cover literary journals and is not focused on the publication of fiction or poetry.

490.700 Readings in Creative Nonfiction
This new elective course features intensive readings and discussion of Creative Nonfiction in its many forms. While the traditional essay, memoir, and article continue to be popular, Creative Nonfiction has reformed these traditions into sophisticated or experimental incarnations. Creative Nonfiction respects reader expectations for factual accuracy, but it also explores new approaches to narrative, factual expression, the blending of fact and fiction, and innovations in structure, theme, and form. Readings include short, medium, and book-length works, digital and in print. This elective course is not a workshop and focuses mostly on reading, discussion and team presentations.

490.701 Advanced Workshop
An advanced workshop is offered occasionally to select students, depending on enrollment and available faculty. The course may focus on a special form or topic, or it may be led by a visiting writer, special instructor, or other experienced faculty member. The concentration in which this course is offered varies. In most cases, enrollment will be competitive, and new writing samples may be required. This workshop counts as one of the three required for the degree. Interested students should discuss this course with their advisor or the program’s director or assistant director. Application information and other details for each Advanced Workshop will be presented in the appropriate term’s Course Schedule. Prerequisite: At least one workshop in the student’s concentration or permission of the program director or assistant director, plus approval through any special application process.

490.702 Readings in Global Fact and Fiction
This elective course presents intensive readings in fiction and nonfiction from around the world. By discussing both fact and fiction, students learn how different cultures, values, and histories create differing literature. Readings will include a sampling from at least three continents, with specific texts announced in advance for each section. Fiction and nonfiction students earn elective credit in this course, which focuses on craft analysis and discussion but also may involve student and team presentations and a final project of creative or analytical writing. This course combines the content of the previous International Nonfiction and 20th Century World Literature.

490.703 Principles of Journalism
Many of today’s finest creative writers have backgrounds in journalism, with its emphasis on research, accuracy, clarity, ethics, and public responsibility. This optional core course features intensive study and exercises in these and other elements, including news writing, interviewing, journalism history, objectivity, deadlines, competition, and professional standards. Students without a background in journalism are urged to consider this course as an additional foundation for their broader creative writing goals. The course includes frequent writing assignments, lectures from practitioners, and exercises in-class and off-site, with analysis of online and print newspapers and news magazines, plus news broadcasts, blogs, and other forms. Some applicants or degree students may be urged to take this course to improve their writing samples or to help prepare for core courses or writing workshops.

490.704 Readings in Essay & Memoir
This reading course focuses on essay and memoir both short and long, with the goal of deeper understanding of these popular writing forms. The course is designed for nonfiction and science-medical writing students; others may consider it with an advisor’s permission. Only minor writing assignments or exercises are included. Students who want to submit their essays and memoir in a writing workshop should consider 490.693 Writing the Memoir and Personal Essay or regular nonfiction workshop.

490.705 Crafting Nonfiction Voice
This craft elective should be of interest to nonfiction and science-medical writers. Through reading and writing exercises, students become familiar with the techniques of re-creating voices of others and of shaping a writing voice of their own. The skill to represent a person’s character, mind, and feelings also is essential to ghostwriters, speechwriters, writing collaborators, feature writers, and novelists. This course focuses on the tools such writers use to craft a voice.
490.706 Business Of Writing
This new course surveys a range of important publication and business issues for writers of any form. General topics include markets, compensation, promotion, contracts, submission methods, and dealing with agents and editors. Specific concerns focus on targeting, query letters, cover letters, and book proposals, with exercises, presentations, and guest speakers included. The course also surveys trends in publishing, including digital and self-publishing. This course may be offered onsite or online.

490.711 Masterworks: Examining the Boundaries
This cross-concentration reading course, designed for students of any concentration, focuses on a writer's analysis of masterworks in fiction, nonfiction, poetry, and science-medical writing and how those forms may be combined in various hybrids. The course involves extensive reading and discussion to study matters of technique and to investigate the changing boundaries among the genres. This course may involve craft reports, response writing, and individual or team presentations, plus a final creative or critical work.

490.712 Teaching Writing: Theory, Practice, & Craft
This elective course is for students in all concentrations who currently teach, would like to teach, or are curious to know what's involved in teaching writing. The course combines practical aspects such as creating a syllabus and responding to student writing with an examination of the roles, values, and beliefs that contribute to good teaching. Students design two courses, one on teaching college-level writing or literature, and the other of the students choice. From this latter, they select a mini-lesson they teach to the class. This course may be offered online or onsite.

490.713 Fiction for Young Readers
This elective course, covering fiction for children through young adults, combines lectures, reading, discussion, exercises, and some workshopping. Besides craft elements such as character, plot, voice, and humor, the course will address professional issues, such as markets, agents, and reader age groups. This course is not a workshop, but students will submit some writing for review. The course is designed as an elective for fiction students, who are urged to complete Fiction Techniques before enrolling. Students from outside the Fiction concentration must have the permission of the program fiction advisor before enrolling.

490.714 Essence of Place: Description, Detail, and Setting
This craft elective course, designed for students from any program concentration, focuses on how detail and setting combine with other techniques to create a sense of place in fiction, nonfiction, and poetry. Readings come from travel, short fiction, memoir, science, novels, nature, poetry, and creative nonfiction. Through reading, discussion, and writing exercises, student learn how to enhance the sense of place in their own writing. This course counts as an elective in nonfiction, fiction, or science-medical writing.

490.715 Hybrid Forms: Innovative Writing Across Genres
This new cross-concentration elective course introduces students to innovative forms and approaches in non-traditional, cross-genre structures of fiction, poetry, creative nonfiction, and intermedia. The course is designed for students who write, or wish to write, in the growing markets of cutting-edge forms—i.e., hybrid memoir, prose poetry, magic realism, lyric essay, intermedia, temporal prose, and more. The course also will interest students who want to explore inspiring and exciting new paths for their writing, even if they have written only in traditional forms. The course, which includes readings, exercises, and later workshops, is open to students and alumni from any program concentration and may count as a workshop with an advisor’s permission.

490.716 Reading Washington
From Frederick Douglass to Gore Vidal, from Rachel Carson to Edward P. Jones, the nation’s capital has been the home of or setting for some of America’s finest writers and writing. This special, elective course focuses on everything in DC from mystery and politics to the inner city and the plight of immigrants. This course will meet for one week from June 15-21, 2014, in an all-day format; students must attend from 9 a.m.-4 p.m., plus some evening events. The reading will be cross-concentration, supplemented by author visits, field trips, and special surprises. Student should complete all reading before this intensive course starts. This course combines some events with students in the Science Writing Residency Course; both courses make up the 2014 Hopkins Conference on Craft. See http://writing.jhu.edu/craftconference for more information. $200 conference fee required.

490.717 The Novel in the 21st Century
This new course explores current trends in longer fiction, comparing innovative and traditional visions of the novel, as well as changing techniques of style, pace, character, structure, and language. The modern novel, in print or digital form, has expanded into interactivity, shaped text, alternative history, and graphic forms; new technologies allow broader experimentation uncurred by traditional publishers. For this course, readings might include novels with innovative forms, such as Cloud Atlas and A Visit from the Goon Squad, in which an entire chapter is delivered in PowerPoint, or novelists who experiment with language, such as Jamaica Kincaid in See Now Then, Peter Carey in The True History of the Kelly Gang, or David Foster Wallace and Mark Richard. We’ll also consider traditional novels influenced by culture, science, and history, such as McCarthy’s The Road or Ian McEwen’s The Children Act. In all, the course offers a strong and valuable context for students to understand the world of novel writing that many of them hope to enter, at the same time considering the traditions from which these innovative works have sprung. While this course is designed primarily for Fiction students, Nonfiction students will find it of value.

490.718 Studies in Digital, Intermedia, and Multimedia Forms
This new course exposes Fiction and Nonfiction students to the very latest forms and innovations arising from digital tools, new media, and collaborative arts. The course generally divides into...
seven weeks that focus on multimedia factual forms, including journalism, essays, and literary nonfiction, and another seven weeks that flow from creative writing, including fiction, creative nonfiction, and poetry. Like a multimedia “reading” course, both parts provide models for student experience, discussion, and inspiration. A central theme will be how technology allows synergistic combinations such as fiction and photography, jazz and dance, and animation and video games. While the course concentrates on exploring and discussing cutting-edge forms, students will be offered analytical and creative options for final projects that involve individual or cooperative expression.

490.720 Literary Journals & The Doctor T.J. Eckleburg Review
This elective course focuses on the editing and production of the national literary and arts journal, The Doctor T. J. Eckleburg Review, which is housed at the Writing Program, and provides a general introduction to the world of print literary journals. Students work with Editor-in-Chief Rae Bryant to explore today's print and digital publishing through both writer and editor lenses. Student will read, discuss, and present prominent journals such as The Missouri Review, The Paris Review, The Hopkins Review, and Tin House; learn Content Management Systems (CMS) as necessary tools for today's writers and editors; read regular submissions to Eckleburg for fiction, nonfiction, and poetry; curate artwork; and read entries in the Eckleburg award contest. Students may submit staff reviews for possible Eckleburg publication. This course counts as an elective for students from any program concentration, and students can enroll from either campus. The course will be at least half online but also will include in-person editorial meetings and opportunities for students to attend local events.

490.721 Drama & Playwriting
This fiction craft elective involves intensive writing and reading to introduce students to basic elements of drama studies and playwriting. Students write part or all of a short play for class critique and may be asked to attend one or more local productions. The course is designed primarily for fiction students who have completed Fiction Techniques. Fiction students who have not completed that course or other students interested in this course must first get their advisor's permission and then contact the fiction advisor for permission to enroll. Enrollees should recognize the extensive writing requirements of this course if they decide to pair it with a workshop.

490.722 Advanced Techniques in Revision and the Elements of Fiction
This elective course is designed to hone skills in the elements of fiction through an intensive revision process. The course is intended for fiction students who have a significant body of writing. All enrolling students must have completed at least one, and preferably two, fiction workshops. The course explores in depth such techniques as expanding/slowing down/erasing a scene, defining and refining character and plot arcs, and using syntax and word choice to strengthen sentences. Students improve the use of these and other techniques by reviewing and revising their own writing. While some workshop methods will be employed, this course will focus more on specific techniques and exercises than a workshop-style evaluation of student writing.

490.731 Film & Screenwriting
In this intensive writing course, students are introduced to the basics of film studies and screenwriting by reading scripts, examining films from a writer's perspective, and writing one or more short screenplays. Topics include dialogue, characterization, plot, subtex, and visual storytelling. The craft elective is designed primarily for fiction students who have completed Fiction Techniques. Fiction students who have not completed that course or other students interested in this course must first get their advisor's permission and then contact the fiction advisor for permission to enroll. Enrollees should recognize the extensive writing requirements of this course if they decide to pair it with a workshop.

490.741 Advanced Poetry Form & Meter
This course offers an intense investigation of meter and form. Students read, write, and critique blank verse, ballad stanzas, sonnets, villanelles, and other forms, and investigate the ways in which contemporary poets work within the critical and historical traditions of formal verse.

490.742 Readings in Poetry
This reading elective invites students to read closely and discuss the work of recent English-language poets and others who will be experienced in translation. The class will focus on extensive reading, analysis, and discussion, with occasional opportunities to write. Poets and prose writers are equally welcome to enroll.

490.743 Trends in Narrative Poetry
For much of the past century, lyric poetic forms were favored so much that readers nearly forgot that narrative poems existed. But a closer look at Frost, Robinson, and Jeffers reveals the beginnings of modernist narrative that endures into the 21st Century. In this reading course, students focus on a broad selection of styles, forms, and subjects to explore narrative arc, character and scene development, dialogue, imagery, metaphor, and other elements. Fiction and poetry students are encouraged to enroll; this course will offer creative and critical writing opportunities.

490.744 International Poetry in Translation
This elective reading course, offered to students in poetry and any other program concentration, features prominent international poetry and poetic forms from a variety of countries, cultures, and centuries. Featured poets may include Nobel winners Czeslaw Milosz, Wole Soyinka, or Derek Walcott. This course also will explore the theories and practices employed by contemporary writers such as Richard Wilbur, Charles Martin, and Rachel Haddas to translate poetry into English. The goal is to provide students inspiring, challenging exposure to new forms, styles, and approaches to verse.

490.745 Voice in Modern Fiction and Nonfiction
In this new cross-concentration craft elective, students examine aspects of voice in fiction and factual writing, considering how style, point of view, tone, structure, and culture all contribute to
an author’s or narrator’s individual writing personality. Students use exercises to strengthen the voices of the characters they portray or of their own work. Readings include novels, short stories, articles, and nonfiction books, as well as articles on craft. Class assignments may include response writings and original fiction or nonfiction as well as oral presentations. This course is the dual-concentration version of 490.683 Voice in Modern Fiction, which covers only fictional works, and 490.705 Crafting a Nonfiction Voice, which is for factual writing.

490.746 Workshop in Review and Opinion Writing
This new workshop focuses on the writing of reviews and other opinion. From blogs to columns to editorials, opinion writing is a diverse field. Among the categories are reviews, which can focus on just about any art or item, including books, film, food, and music. Critics develop specialized knowledge to help readers assess how to spend money, time, or attention. Students might be asked to attend films, concerts, and plays, or to critique certain books and recordings. In the broader area of opinion, students explore conventions governing effective editorials, personal columns, or other kinds of commentary. Student must complete Nonfiction Techniques or Techniques of Science Medical Writing before enrolling, or receive permission from their advisor.

490.747 Advanced Revision Techniques in Fiction
This elective course is designed to hone skills in the elements of fiction through an intensive revision process. The course is intended for fiction students who have a significant body of writing. All enrolling students must have completed at least one, and preferably two, fiction workshops. The course explores in depth such techniques as expanding/slowing down/“exploding” a scene, defining and refining character and plot arcs, and using syntax and word choice to strengthen sentences. Students improve the use of these and other techniques by reviewing and revising their own writing. While some workshop methods will be employed, this course will focus more on specific techniques and exercises than a workshop-style evaluation of student writing.

490.750 Contemporary Science-Medical Writing: Creative and Professional Forms
This core course provides a broad foundation in the diverse forms and venues encountered in contemporary science writing careers. Students learn elements of classic forms such as essay, profile, news article, and op-ed, and examine the range of venues for science writing, including magazines, institutional publications, literary journals, blogs, speeches, and even museum exhibit text. The course covers the differing goals of various forms and how they might be used in multimedia, social networks, and other digital communication. Guest speakers present real-world expertise, with students engaged in discussion, exercises, and writing assignments.

490.755 The Power of Story: Teaching and Writing Narrative
This Teaching Writing Program course is designed for students who wish to teach and write narrative, whether fictional or factual. The course covers elements of narrative, including action, character, setting, tone, pacing, dialogue, and theme, plus the terms writers use to discuss and analyze narrative. Teaching Writing students learn how to introduce this language in their classrooms and to engage their own students in discussion about assigned reading and writing. Students read and analyze short stories, narrative essays, and at least one novel and nonfiction narrative book, as well as articles on teaching process and theory – including recent brain research concerning the value of narrative. Students in this course also write original narratives from prompts and discuss those writings in a workshop environment. This course helps teachers understand the differences between factual and nonfactual writing, and how they can be separated or combined.

WORKSHOPS

490.673-674-675 Science-Medical Writing Workshop
In a writing workshop, students receive professional guidance in translating complex scientific, medical, or technological knowledge and research into graceful, lucid prose. Students submit individual essays or articles, or parts of a larger work in progress. Writing submissions are critiqued by peers as well as by the instructor, then revised. Students are encouraged but not required to take this course from different instructors. (The three section numbers designate the term in which the workshop is offered. Students earn workshop credit by taking any section number multiple times, or by combining any sections.)

490.754 Specialized Science Writing Workshop
This writing workshop follows the format of 490.673 Science-Medical Writing Workshop, but students will focus their writing on a special topic such as technology, science profiles, or science books. The topic for a Specialized Workshop will be announced in advance. This course may be taught by a visiting writer or other special instructor.

490.756 Advanced Science Writing Workshop
This writing workshop follows the format of 490.673 Science-Medical Writing Workshop but is designed for students who have completed one or more earlier workshops and who want to focus on more sophisticated reporting and writing projects. This course may be taught by a visiting writer or other special instructor. At times, admission to this course may be based on a special application process.

490.784 Reading and Writing New England
From Emerson, Frost, Melville and Wharton, through such contemporary writers as John Updike, Marilynne Robinson, Tracy Kidder, and Elizabeth Strout, New England is rich in literary heritage. This cross-concentration reading and craft course for the Hopkins Conference on Craft in Bar Harbor, Maine, focuses on a writer’s analysis of essays, poems, stories, or books set in or written by writers from this region. We’ll cast a particular eye toward a sense of place, and we’ll look at how works grow out of the New England literary tradition and how they connect to any literature from a particular region or culture. Participants write creative and reflective responses to the readings and discussions. This condensed course counts as an elective for students in any concentration.
490.785 Reading and Writing Baltimore
This cross-concentration reading course offers students in Fiction, Nonfiction, or Science Writing a chance to experience the best writing of Charm City, whose long history of literature ranges from Fitzgerald and Poe, to Douglass and Dos Passos, to Mencken and Baker. The course will be offered for the first time at the 2013 Hopkins Conference on Craft in Baltimore. Featured will be advance reading assignments before the conference, plus literary tours, guest speakers, and opportunities for students to test their own writing about one of America’s great cities. Readings will include essays, stories, poems, and books, both from the past and from contemporary writers such as Anne Tyler, Madison Smartt Bell, or John Waters.

490.800 Independent Study in Writing
An independent study is a special project that an advanced student proposes to complete within a single semester, for either elective or workshop credit. Most independent studies in the Writing Program involve a student working one-on-one with a faculty member. The project must involve writing or writing-related work equivalent to a full-semester, graduate-level course, and the project must not duplicate any course or other part of the program’s curriculum. Students usually are not eligible to propose independent studies until they have completed at least five courses, including at least one workshop. The tuition for an independent study is the regular, single-course rate for the term in question. Proposals for an independent study must be submitted in writing to the program’s independent study coordinator no later than 60 days before the start of the target semester. Proposals are evaluated competitively after that date, and only a small number of proposals will be approved.

490.801 Thesis And Publication
This final course is required for all degree candidates in fiction or nonfiction and is offered only in the fall and spring terms. The two course goals are the completion of a successful thesis and an enriching, challenging capstone experience for the entire program. A creative writing thesis must be of considerable ambition and length — portions of a novel or a nonfiction or science-medical book, or a collection of poems, short stories, essays, or articles. Thesis students should select their best, most revised work from previous program courses; not all program writing will become part of a thesis. Students in this course are required to submit a full thesis draft early in the course; the author spends the term revising this draft. To provide extensive time for revision, thesis students meet as a class only for certain weeks during the term. During those class sessions, students contribute to and edit a class journal project, engage in forward-looking discussions on the writing life, participate in a program-capping roundtable discussion, and rehearse and conduct a public reading. Prerequisite: All other required and elective courses. Students may not take another course during their thesis term without program permission; such a course must be in addition to program requirements. Students enrolling in this course must submit a Thesis Planning Form at least 30 days in advance.

RESIDENCY COURSES

490.691 Science Policy, Funding, and Politics
This Residency course, intended to be onsite in Washington, D.C., explores how science, medicine, and technology can be affected by politics and practices within government, the private sector, and within the fields themselves. Students use the evolution of science policy as context for discussion, research, and writing about contemporary issues. Students will meet with leaders from Capitol Hill, the White House, and federal agencies.

490.708 Medicine in Action
This special Residency course based at Johns Hopkins Hospital in Baltimore allows writing students, program alumni, and others to experience the front lines of medicine. Participants spend time observing doctors and nurses in action and may be assigned to follow a practitioner during a full work shift at the hospital. The course also includes meetings with doctors, nurses, and patients, plus a final writing project. Previous sections of this course included meetings with winners of the Nobel Prize and Pulitzer Prize.

490.709 Science in Action
This Residency course takes students to the front lines of scientific research, with a focus on developing writing ideas, reporting skills, and the craft of explanatory writing. Science in Action focuses on fields beyond medicine and health, including space, environment, energy, climate change, and other topics. The course involves field trips and lab visits, plus video and other links with visiting or out-of-town scientists. This Residency course may be held in Washington and Baltimore or in other locations, as announced.

490.710 In the Field: Science Writing in the Woods, Coasts, & Labs of Mt. Desert Is., ME
Mount Desert Island, Maine, home to Bar Harbor and Acadia National Park, is a place of exquisite natural beauty. With thriving environmental science centers and a world-class genetics laboratory, the island is also a hub of cutting-edge research. This Hopkins Conference on Craft science-medical writing course allows participants to immerse themselves in the region’s stimulating natural and intellectual environments while honing their reporting skills, refining their writing artistry, and gathering information for stories. Extensive field excursions will be announced. This condensed course provides residency credit for students enrolled in the online / low-residency Science-Medical Writing concentration.

ELECTIVE COURSES

490.696 The Nature of Nature
This reading course focuses on Mother Nature, human nature, and the nature of the beast. Students analyze books, essays, and articles from writers who tell gripping, true stories about topics ranging from outdoor adventure to personal reflections on illness. Readings include authors such as Richard Selzer, Diane Ackerman, E.O. Wilson, Kay Redfield Jamison, and John McPhee.
490.697 The Literature of Science
In this reading elective, students analyze current and classic books, magazine articles, and newspaper series to discover how the best science, medical, nature, and environmental writers create compelling, entertaining, factual literature. Craft topics include structure, pace, sources, content, and using language to explain complex subjects or to create lyrical writing. Assignments may include brief reviews and team presentation of one of the books read for the course, which may include such writers as Erik Larson, Atul Gawande, Rachel Carson, John McPhee, James Gleick, Lewis Thomas, Elizabeth Kolbert, and Jonathan Weiner.

490.707 Prize Winners: The Best Writing about Science, Technology, Environment, & Health
Whether the prize is a National Magazine Award, a Pulitzer, a Peabody award for electronic media, or other honors, the work in this course offers lessons in reporting and writing for any student. A special feature will be sessions with prize-winning authors, by video or tape, to discuss how they created their winning work. Readings and guest for each section of this course will be announced, but they might include Pulitzer-winners Diana Sugg, Siddhartha Mukherjee or Natalie Angier, Peabody winner Christopher Joyce, or National Book Award finalist Lauren Redniss. Students in this course join in team or individual presentations, with several options for a final writing assignment. Readings may include articles, essays, or books.

490.708 Masterworks: Examining the Boundaries
This cross-concentration reading course, designed for students of any concentration, focuses on a writer's analysis of masterworks in fiction, nonfiction, poetry, and science-medical writing and how those forms may be combined in various hybrids. The course involves extensive reading and discussion about matters of technique and to investigate the changing boundaries among the genres. This course may involve craft reports, response writing, and individual or team presentations, plus a final creative or critical work.

490.719 Technology Tools, Multimedia, and Digital Publications for Writers
This course is a practical, hand-on experience that teaches students tools and theories for multimedia and online writing and publication. Students learn basic design and digital tools for text, audio, photography, video, and social networks, with a special emphasis on adapting to changing technologies. To better understand websites, literary journals, magazines, and other digital publications, students will create their own digital sites or publications. This course also showcases various digital publications and sites that might offer publishing opportunities. This course may cover general writing topics and fields, or, as announced, it might focus on a specific field such as science writing, nonfiction, technology writing, or fiction.

490.752 Advanced Reporting & Writing in Science
This course continues to build skills in writing and reporting about science, medicine, or technology. This elective course expands into more advanced techniques and also expands knowledge of longer or more sophisticated forms such as magazine essays, narrative nonfiction, and investigative reporting. Students will engage in reporting and writing exercises, which may be discussed in group workshops.

490.807 Internship in Science Writing
Internships are available to select students with advisor approval. Students should submit an internship proposal well in advance. With the advisor's help, students may develop their own internship where they live, or they may apply for existing internships at publications, companies, agencies or elsewhere. Internships usually are reserved for students who have completed four courses or more. In most cases, an Internship counts as an elective.

490.808 Independent Study in Science Writing
An independent study is reserved most often for students who have special interests not covered in the program's existing curriculum. Students must submit an Independent Study proposal at least 60 days before the start of any term. Only a limited number of Independent Studies will be approved each year. In some cases, Independent Studies may be approved for special situations such as student illness, relocation, or significant life changes. Students interested in Independent Studies should consult their advisor well in advance.

Independent Studies usually are reserved for students who have completed four courses or more. With advisor approval, this course counts as an elective or workshop.

THESIS

490.802 Thesis and Careers in Science Writing
This final degree program course involves the creation of a thesis and a final capstone experience that prepares a student for a writing career. If possible, student should enroll in this final program course after completing all other cores, workshops, and electives. Thesis: Each student's thesis is created from work in earlier courses. Students revise and refine an individual portfolio that includes creative writing, journalism, and communication writing. Thesis work is completed independently with the course instructor and a thesis advisor. Students must submit a Science Writing Thesis Planning Form at least one month before the course begins. The first draft of a thesis is due in the second week of the thesis term; students spend the term revising that work. Capstone: The group experience of the course requires each participant to develop a career plan that includes personal goals such as publication, job applications, or job advancement. Other capstone experiences may include attending science writing events or seminars, publication of a course magazine or journal, and discussions of the changing business of writing. The Science Writing Program also may propose an optional mini-residency that includes a series of final onsite experiences at Johns Hopkins in Baltimore and Washington.

490.803 Independent Study
An independent study is a special project that an advanced student proposes to complete within a single semester, for either elective or workshop credit. Most independent studies in the Writing Program involve a student working one-on-one with a faculty member. The project must involve writing or writing-
related work equivalent to a full-semester, graduate-level course, and the project must not duplicate any course or other part of the program's curriculum. Students usually are not eligible to propose independent studies until they have completed at least five courses, including at least one workshop. The tuition for an independent study is the regular, single-course rate for the term in question. Proposals for an independent study must be submitted in writing to the program's independent study coordinator no later than 60 days before the start of the target semester. Proposals are evaluated competitively after that date, and only a small number of proposals will be approved.

490.804 Independent Study
An independent study is a special project that an advanced student proposes to complete within a single semester, for either elective or workshop credit. Most independent studies in the Writing Program involve a student working one-on-one with a faculty member. The project must involve writing or writing-related work equivalent to a full-semester, graduate-level course, and the project must not duplicate any course or other part of the program's curriculum. Students usually are not eligible to propose independent studies until they have completed at least five courses, including at least one workshop. The tuition for an independent study is the regular, single-course rate for the term in question. Proposals for an independent study must be submitted in writing to the program's independent study coordinator no later than 60 days before the start of the target semester. Proposals are evaluated competitively after that date, and only a small number of proposals will be approved.

490.805 Writing Internship
Advanced students in the Writing Program may propose an internship to receive on-the-job experience in writing or a writing-related profession. An approved internship receives one full course credit toward the MA in Writing degree. Students may propose to participate in existing internship programs, or they may arrange an individual internship. In most cases, students should have completed four or more courses toward their degree before seeking an internship, and proposals must be submitted in writing to the program's internship coordinator at least 60 days before the start of the target term. Proposals are evaluated on a competitive basis. Only a limited number will be approved, and priority will be given to students who have completed the most degree-level courses and who submit proposals that demonstrate the best internship experience. Internships may be paid or unpaid. Because students receive course credit for internships, they pay tuition levels equal to one graduate course.

490.888 Thesis Continuation
This course is for students who completed 490.801 Thesis & Publication or 490.802 Thesis and Careers in Science Writing but failed to finish an approved thesis and were not approved for an Incomplete. If both conditions are met, students must register for this course and pay its accompanying fee for every term (including Summer) until a final thesis is approved.
Johns Hopkins Post-Baccalaureate Premedical Program

The Johns Hopkins Post-Baccalaureate Premedical Program gives college graduates and professionals the opportunity to take the required courses for admission to leading medical schools. Students enroll in the Krieger School of Arts and Sciences' day classes to complete the core premedical curriculum known for its rigor and quality. Designed to meet the needs of diverse and talented individuals, this program is for students who have excellent academic records in undergraduate (and graduate school, if applicable), have never applied to medical school, and have the ultimate goal of entering the medical profession. The basic curriculum includes Biology, General Chemistry, Organic Chemistry, and Physics with labs. Generally, students must not have previously taken more than one-half of the science courses required for entering medical school. The typical program takes 9 to 14 months of full-time study.

This program emphasizes personal attention and numerous elective opportunities. An eight-week lecture series involving Hopkins medical school faculty is the basis of a one-credit seminar course taken exclusively by the post-baccalaureate students. Over intersession students may participate in a three-week hospital internship that includes medical rounds, patient reports, and mentoring by physicians. Students also gain experience in areas of interest related to medicine through classes provided by other university divisions, such as tutorials at the School of Medicine.

Having a fulfilling post-baccalaureate experience is more than just academics. It is also being a part of the Johns Hopkins community of students and faculty. To help build student support and friendship there are planned activities that include speakers and monthly dinners.

For more information please check the Post-Baccalaureate Premedical Program Web site at jhu.edu/postbac, or telephone 410-516-7748.

Johns Hopkins Summer Programs

Hopkins Summer Programs offers credit classes to Hopkins undergraduates, visiting undergraduates, and qualified high school students. The Summer Session includes two five-week terms, which run generally late May through early August. Five-week and two-week credit-bearing programs designed especially for high school students are also offered.

The Krieger School of Arts and Sciences and the Whiting School of Engineering sponsor the Summer Session courses, providing the same academic rigor as required in their spring and fall terms. The Pre-college Program places academically talented high school students in undergraduate classes, allowing them to earn credit and a Hopkins transcript, useful in the college application process. Discover Hopkins Programs for high school students are topic-based programs that showcase Hopkins faculty and programs. Visiting students earn credit to transfer to their home institutions or to explore subjects of personal or professional interest. This variety of students and course offerings makes the Homewood campus a busy, vital educational center in the summer. Go to jhu.edu/summer.
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The Advanced Academic Programs holds classes at three locations:

**THE WASHINGTON, DC CENTER**
1717 Massachusetts Ave NW, Suite 104
Washington, DC 20036
202.452.1280

**HOMEWOOD CAMPUS**
Wyman Park Building Suite S740
3400 N. Charles Street
Baltimore, MD 21218
410.516.6749

**MONTGOMERY COUNTY CAMPUS**
9601 Medical Center Drive
Rockville, MD 20850
301.294.7000
Johns Hopkins University, founded in Baltimore, Maryland in 1876, was the first research university in the western hemisphere that integrally linked teaching and research for the advancement of knowledge. Its establishment engendered a revolution in US higher education.

Over the course of nearly 20 years, Advanced Academic Programs has worked diligently to add new degree programs that fit within the academic structure of the School of Arts and Sciences and satisfy the demands of the marketplace. This approach to growing AAP has quickly become its hallmark, allowing it to be nimble and forward-thinking, while staying true to its core academic disciplines.