Instructor: Dr. Edward Seiler
E-mail: eseiler1@jhu.edu
• Note: There is no specified class time. However, I will upload materials as if there is a class on
  Thursday evenings. Problem sets are also due on Thursday evenings by 8 pm (Eastern).
• There will be no class on March 17th due to the Spring break. I will upload materials for week 7 on
  March 10th and for week 8 on March 24th.
Website for Course: http://aap.sakai.jhu.edu. Note that access to this site requires a Johns Hopkins Enterprise Directory
(JHED) password

Course Overview
This course covers a number of advanced microeconometric techniques frequently encountered in applied econometric
analysis. The aim of the class is to teach when specific microeconometric methods are suitable for use, to understand the
mechanics of these methods and to be able to apply them in a software package of choice. Topics include:

• A review of basic OLS techniques using matrix algebra
• Instrumental variable estimation
• Panel data
• Maximum likelihood estimation
• Qualitative dependent variable analysis (Logit, Probit)
• Limited dependent variable analysis (Tobit models, Heckman two-stage selection models, duration models)
• Seemingly unrelated regression

Requirements and Grading
The emphasis in the course will be on the application of the above techniques in the form of three computer-based problem
sets and two term papers. Given the online nature of the course, class participation through discussions will also be a
component of the course grade.

Each problem set will account for 8% of the final grade. The first term paper will require that students choose an academic
article, summarize the article and replicate the main results. Each student will then have a presentation of the article summary
posted (by me) in a specified unit. For each student’s posting, two students will be required to post a referee report. The first
term paper will account for 20% of the final grade. Each referee report will account for 8% of the final grade. The second
term paper will require that students use a dataset of their choice to investigate a research question that can be analyzed using
the econometric tools covered in class. The second term paper will account for 30% of the final grade. Class participation
(through discussions) will make up the last 10% of the final grade.

I (naturally) require that all students adhere to the Johns Hopkins level of required ethics in this course. Please make sure that
you are familiar with these rules.

Readings
The main textbook for this course is:

• A Guide to Modern Econometrics (2nd or 3rd editions) by Marno Verbeek
I have also added an optional (but very useful) book to the reading list:

- **Mostly Harmless Econometrics: An Empiricist’s Companion** by Joshua D. Angrist and Jorn-Steffen Pischke

In addition the following texts will be helpful:

- **Econometric Methods** (4th ed.) by Jack Johnston and John DiNardo
- **A Guide to Econometrics** by Peter Kennedy
- For STATA users: **Statistics with STATA** by Lawrence Hamilton
- For SAS users: **The Little SAS Book : A Primer** by Lora D. Delwiche, Susan J. Slaughter
- For SAS users: **A Handbook of Statistical Analyses using SAS** by Geoff Der and Brian Everitt

**Questions**

The best way to get in touch with me is by email or through the private messages section in Sakai. I will go online at least three times a week to answer mail. I will also be happy to meet with students by appointment.

**Tentative Schedule**

I will be teaching the class in units. Some units will contain material for one week, while others will contain two weeks of material. Units will be uploaded on Thursday (at 1 am Eastern) of the specified week. Once I have uploaded a unit, it will not be removed from the course website until the end of the course. For each unit I will upload class notes and links to videos.

Unit 1: Overview of matrix algebra and statistical theory (Week 1 – Jan 27)
Unit 2: OLS – a matrix algebra approach (Weeks 2 and 3 – Feb 3 and Feb 10)
Unit 3: Instrumental variable estimation (Weeks 4 and 5 – Feb 17 and Feb 24)
Unit 4: Panel data (Weeks 6 and 7 – Mar 3 and Mar 10)
Unit 5: Maximum likelihood estimation (Week 8 – Mar 24)
Unit 6: Models with limited dependent variables (Weeks 9 and 10 – Mar 31 and Apr 7)
  - During week 9 I will upload one-third (or so) of the student presentations
  - During week 10 I will upload the second third of the student presentations
Unit 7: Tobit models and the Heckman selection bias model (Week 11 – Apr 14)
  - During this week I will upload the last third of the student presentations
Unit 8: Duration analysis (Week 12 – Apr 21)
Unit 9: Systems of equations (Week 13 – Apr 28)

In the last week of the semester (Week 14) students will complete their final papers and email them to me.

**Guidelines for Discussions**

The discussion section of Sakai will be available for the interaction between the students and me, and among the students themselves. The discussion section in Sakai has three sections. The main section is the “Class Discussions” section. Please ask questions in the “Questions” section. These questions are viewable to everyone. I will generally wait a few days before I answer questions in order to give other students the opportunity to provide answers. Note that if you have a question that you want me to answer, please send me a “Private Message” in Sakai or an email. The third section is the “Student Lounge.” This is solely for student use, and I will not enter into your “private domain.”

**Class Discussions**

Participation in class discussions will contribute to 10% of the final grade. For each discussion thread I initiate, each student needs to post at least one time. Note: The substance of your post is more important than the length of your post – try to keep each posting short and to the point.
I will monitor each unit’s discussion at least twice a week. I will also pose questions to stimulate discussion and to gauge how well each student understands the material. When contributing to a discussion thread please pay attention to what has already been posted. Add to the discussion by commenting on other students’ postings or by responding to questions that have not yet been addressed. I expect students to contribute in a timely fashion to class discussions. I will not give credit to discussion posts that relate to “old” discussion threads.

Guidelines for Term Paper 1

The purpose of the paper is to utilize the techniques developed in this and earlier courses to conduct research. The first paper will replicate someone else’s work and lay the groundwork for the second term paper.

To complete the first paper I suggest the following steps:

1. Go to the library and browse through some recent economic journals. I suggest you stay away from top tier journals (Econometrica, American Economic Review, Journal of Political Economy, and Quarterly Journal of Economics). Alternatively, authors have working papers on their websites. These papers have the advantage in that the authors have worked on these papers recently and the likelihood that they still have the data readily available is greater.
2. In selecting an article pay particular attention to the data and models that are used. Make sure that the data is publicly available and that the econometric techniques fall within the scope of the course. I would suggest that you don’t use one of the publicly available panel or large household datasets unless you are ready to spend a great deal of time reading the documentation.
3. Try to replicate the results reported in the paper. This is not easy to do, but try to get approximate results. I give credit for good explanations as to why results are different that the authors’ original results.

The format of the term paper should be as follows:

1. Introduction: A brief statement of the problem and a brief summary of the main results.
2. A quick review of the article, both the theory and the empirical results
3. The data and model used
4. Your results
5. Conclusions and suggestions for further work

You should write this paper in a slide (bullet point) format (e.g., PowerPoint). I suggest that you limit your presentations to 15-20 slides. On the due date please send me your presentation – to the private discussion area or drop box in Sakai or to my email. For each paper I will then assign two other students to write referee reports. These should also be sent to me on their respective due dates. I suggest referee reports be kept to 3-4 PowerPoint slides each. I will post the papers and the referee reports into Sakai over three weeks in the second half of the semester.

I encourage you to pay attention to other students’ papers. You will learn more from your peers’ applied work than from me or any other lecturer!

Timeline:

- By 3/10/2011 (week 7) choose your article and email me a copy of the article to me.
- Please submit your completed paper to me by 8 pm (Eastern) on Tuesday 3/29/2011.
- I will assign two referees for each presentation – these assignments will be posted before the start of class 3/31/2011 (week 9).
- I will also post one-third of the presentations (randomly selected) before the start of class on 3/31/2011 (week 9).
- Referee reports for the presentations posted on 3/31/2011 will be due on 4/7/2011 by 8 pm (Eastern).
- This process will be repeated twice. I will post one-third of the presentations on 4/7/2011 and one-third on 4/14/2011. Referee reports will need to be turned in by 4/14/2011 and 4/21/2011 according to the post dates for their respective papers.
- Referee reports should be sent to me and to the student whose work you refereed.

Guidelines for Term Paper 2

This paper will give you an opportunity to ask a question of interest to economists and use one of the tools learned in class to answer it. I suggest that you use one of the main topics of the course in this research (IV estimation, panel data, qualitative
dependent variable analysis, and/or limited dependent variable analysis). I advise against undertaking new data collection for the sake of this paper. Instead I recommend that you a dataset available at work or download a publicly available set of data from the internet. The paper may be based on a different topic than the first term paper, or depending on your preference, you may use your first term paper as the starting point for the second paper.

The format of the term paper should be as follows:

1. Introduction: A clear statement of the question being asked and why it is of interest
2. Model Specification: Provide a formal description of the economic and statistical aspects of the model you are employing. If you have some specific hypotheses that you will be testing this is a good place to describe the hypotheses and the model restrictions they imply
3. Data Description: Where the data comes from, how it was collected, variable definitions, and summary statistics
4. Results: providing tables of the estimated model(s) and your interpretation of your findings
5. Hypothesis tests: Use econometric hypothesis testing to answer relevant economic question(s).
6. Conclusions: Describe what you have learned from this exercise and, perhaps, what further analysis or data collection might be suggested by your results

Please keep your paper brief – this is a term paper not a Ph.D. dissertation. This paper should be written in “term paper” format (i.e., Word as opposed to PowerPoint). I suggest 4-7 pages (including tables). In addition to the paper please submit the computer output that generated the results described in the paper, labeling the results so that I can readily match the output with the results reported in the paper’s tables.

The paper itself is due on May 5, 2011 by 8 pm (Eastern).