Illinois Institute of Technology  
Stuart School of Business  
Course Syllabus  
Fall 2016

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**Instructor Information**

Name: Matthew Dixon  
Office: Swing office (DTC) and 18D5-2 (IIT Tower)  
Telephone: 650-704-2977 (cell)  
Fax:  
Email: matthew.dixon@stuart.iit.edu  
Office hours: Group office hours shall be scheduled  
TA Information: TBC

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**Course Information**

Course #: 567  
Course name: Bayesian Econometrics  
Course description: Bayesian econometrics provides a powerful statistical modeling approach which incorporates an analyst’s prior knowledge of the behavior of model parameters. This class of models has grown substantially in recent time owing to the ability to solve these models with compute intensive simulation techniques. In this course, students shall learn the Bayesian theory and the computational tools used in modern Bayesian econometrics. The student shall also learn how to put the theory and computational tools together in the context of substantive empirical problems arising in finance.

Course day and time: Tuesday, 1:50pm - 4:30pm  
Course Objectives: On completion of the course, the student should expect to demonstrate expertise in the following topics:

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Part I: Bayesian Theory

- Review of probability theory  
- Posterior distributions and Bayesian Inference  
- Prior distributions
Part II: Simulation
• Introduction to Monte Carlo simulation
• Simulating from continuous and discrete distributions
• Resampling methods
• Basics of Markov Chains
• Markov-Chain Monte Carlo simulation
• Gibbs sampling
• Metropolis Hastings algorithms
• Convergence acceleration

Part III: Applications
• Linear regression
• Dynamic linear models
• Hierarchical models
• Latent variable models

Pre-requisites: Advanced probability and statistics

Required Course Materials

Text:
Materials:
Software: R, RStudio
Programming Skills: R

Text References:

Recommended Course Materials

Supplemental texts/reading:
2. Introduction to Bayesian Econometrics, E. Greenberg, Cambridge University Press.
Software: Jupyter notebooks
Some other good books:
Text References:

Course & Instructor Policies

Make-up: Verifiable medical emergency or, at the digression of the instructor, with prior consent.
Late work: At the digression of the instructor and automatically subject to a 10% penalty unless due to verifiable medical emergency.
Special assignments: N/A
Class attendance: Any student that misses more than three classes will forfeit a 10% penalty towards their final grade. It is the responsibility of the student to ensure that they keep abreast of the class material.

Classroom conduct: Cell phones to be turned off. Laptop use in class for work only.
Discipline: The instructor reserves the right to ask any student disrupting the class to leave the room. An oral exam will be given in lieu of a mid-term or final if the student is suspected of plagiarism during a written exam.

Grading System/Policy

Percentages for assignments:

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Class Exercises/Participation</td>
<td>10%</td>
</tr>
<tr>
<td>Homework</td>
<td>35%</td>
</tr>
<tr>
<td>Mid-Term</td>
<td>20%</td>
</tr>
<tr>
<td>Final</td>
<td>35%</td>
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</tbody>
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Grade scale: A-C (graded to a curve)
Incompletes:
Disabilities

Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources. The Center for Disability Resources (CDR) is located in 3424 S. State St., room 1C3-2 (on the first floor), telephone 312-567-5744 or disabilities@iit.edu.
Copyright/Plagiarism/Academic Integrity

Rules on Plagiarism and Academic Integrity

Plagiarism and other violations of academic integrity are strictly prohibited and subject to penalty as defined by the University. Information about the IIT academic requirements for graduate students can be found at:

http://www.iit.edu/graduate_college/pdfs/Graduate_Student_Handbook.pdf

The academic integrity material in the handbook is found at page 31 in the IIT student handbook. Other parts of the handbook also contain material and rules that apply to graduate students. Students will be expected to conform to the rules and procedures set forth in the handbook.

The code of conduct governing writing by students at IIT requires original writing, prohibits plagiarism and provides severe sanctions for plagiarism. Original writing consists of thinking through ideas and expressing them in your own way. If the ideas are from other sources, use footnotes or other citation methods to indicate the source of the ideas. Plagiarism is the act of passing off someone else’s work or ideas as your own. The sanctions include, but are not limited to, expulsion and the imposition of a punitive grade of ‘E’.

What is Plagiarism?

Often there is some confusion as to what constitutes plagiarism. Plagiarism is the act of passing off someone else’s work as your own. To assist in providing an understanding of the types of writing that constitute plagiarism, three types of are each discussed below. Also discussed below is the problem of “string citations.” String citations are not plagiarism, but many professors will reject string citations because they are not the student’s original work.

Word for Word copying: The use of any phrase or excerpt from another source requires the use of quotation marks around the copied material, or if the material is more than a few lines, the copied material should be placed in its own indented paragraph. A citation in proper form is always required to identify the source.

Plagiarizing by Paraphrase: When a writer uses a source, substitutes words and sentences, or even changes the order but keeps the meaning of the original, a citation is required. In the example given below, the original is on the left. The paraphrase in the right box constitutes plagiarism.
It is not generally recognized that at the same time when women are making their way into every corner of our work-world, only one percent of the professional engineers in the nation are female. A generation ago, this statistic would have raised no eyebrows, but today, it is hard to believe.

A generation ago, this statistic would have raised no eyebrows, but today, it is hard to believe.

The writer could avoid plagiarism here by acknowledging the source and providing a proper citation.

Mosaic Plagiarism: Here the writer lifts phrases and terms from the source and embeds them in his own prose. An example follows in which the lifted phrases are underlined:

The pressure is on to get more women into engineering. The engineering schools and major corporations have opened wide their gates and are recruiting women zealously. Practically all women engineering graduates can find attractive jobs. Nevertheless, at the moment, only one percent of the professional engineers in the country are female.

Mosaic plagiarism is sometimes caused by careless note taking. However, it looks dishonest and is judged as such. The use of quotation marks around the original wording and citation avoid the problem of plagiarism. Often a better approach is to use paraphrase or to quote directly (with appropriate citations).

Plagiarism can be avoided by providing citations for the sources of any material, including ideas, phrases, or sentences that you have used in your paper. A number of different systems are available for providing citations. The key to all of them is that the writer must clearly identify for the reader the sources of all material (including ideas) that have come from somewhere else.

String Quotation Problem: Sometimes a student will write a paper consisting of a string of quotations. It is usually much better for a student to provide his or her own analysis and write the paper in his or her own words. Many professors will reject a paper consisting primarily of material quoted from other sources because they do not view such a paper as the student’s own work. You should understand your professor's view with respect to string quotations prior to writing your paper.
Academic/Class Calendar & Assignments

Topics: See course homepage for course agenda

Reading Assignments:
Homework:
Due Dates:
Exam Dates:
Withdrawal dates: