



# Econometrics

Eco 338

Fall 2016

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**Professor:** Li Qi

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**E-mail:** lqi@agnesscott.edu

**Web site:** Moodle

**Office Hours:** Tuesdays 11:30 am to 1:00 pm or by appointment

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◆ **Course objective:** This course introduces students to regression methods for analyzing data in economics and related areas. It addresses both the theoretical and practical aspects of statistical analysis, focuses on techniques for estimating econometric models of various kinds and interpreting the estimates from such models. The objective is for the students to learn how to conduct – and how to critique - empirical studies in economics and related fields. Accordingly, the emphasis of the course is on empirical applications. The mathematics of econometrics will be introduced only as needed and will not be a central focus. This is a required course for the Economics major and minor. It fulfills the Social Sciences Requirement for students who entered prior to Fall 2015.

◆ **Student learning outcomes:** Students will

- learn to describe probability (including joint and cumulative probability) distribution of random variables, calculate probabilities (including joint and conditional probabilities) of random events, means, variance, standard deviation, covariance, correlation of random variables
- learn to use normal, chi-squared, F, and sampling distributions to calculate the probability of random events
- learn to apply law of large numbers and central limit theorem to construct sampling distributions, perform hypothesis testing and build confidence intervals
- learn to interpret linear and non-linear regression models, obtain OLS estimators, understand concepts such as theoretical assumptions for OLS estimators, regression residuals, R-square, SER, heteroskedasticity, omitted variable bias etc. and use these concepts to analyze and assess regression results

- learn to perform hypothesis testing and construct confidence intervals (sets) for regressions with single- or multiple-regressors as well as binary variable regressors
- learn how to assess internal and external validity of regression models
- learn to use Stata software to apply the above concepts and techniques to real data sets

◆ **Course prerequisites:** Eco 215

◆ **Lectures:** Tuesdays and Thursdays 10:00 am – 11:15 am at Campbell 228.

◆ **Credit and workload:** Eco 338 is a 4-credit course. In addition to in-class time, you will be spending a minimum of 3 hours per week in preparation for our class sessions, including viewing material posted on Moodle, completing reading assignments before coming to class. You should also plan to spend an additional 5-7 hours per week working on problem sets and Stata projects, and studying for quizzes and exams for this course.

◆ **Textbooks:** J.H. Stock and M.W. Watson, *Introduction to Econometrics* (third edition), Addison-Wesley.

◆ **Moodle:** I will update this course's Moodle website regularly. Students are expected to check that site and their email for messages regarding the course. I warn you that, while your individual test and homework grades are correct on Moodle, the "Course Total" on Moodle is NOT your average in the class. That number is calculated by Moodle and does not reflect how I calculate your average grade. Please ignore that number.

◆ **Homework assignments:** The homework problems are designed to help you learn the material. Some of the assignments involve empirical analysis. The data for the problem sets will be posted on the course web page. Some of the problems assigned to your homework will be covered in the lectures and the solutions to the homework will be given in the next lecture and discussed as well. You will turn in all homework assignments on time and a few randomly chosen homework questions/assignments will be graded and count toward your course grade.

◆ **Homework policy:**

- To get full credit for your homework, you must hand it in on time, that is, at the end of the class on the due date.
- Homework handed in after the end of class on the due date is considered late homework. The penalty for lateness is  $1/3$  of the assignment grade for every day late. For example, if your score is 90/100 but you are two-days late, then your homework score will be  $90 - (2/3)*100$ . After three days you will get no credit.
- Once you get your homework back, you have two weeks to request grade revision. Keep your homework on a safe place, since you may need it later in case of any grade clarification.

- Students requesting revision of a homework grade must submit their claim in writing, no later than two weeks after the grades have been distributed. Please include a brief argument/reasoning for grade change. For example, if you feel that your answers are correct but you did not get the credit, list reasons or evidence to support your argument.

◆ **Quizzes:**

4 quizzes will be given during the semester. The quizzes will be worth 10 percent of the course grade (best 3 out of 4). All quizzes will be in lecture (please refer to the course schedules on the last page of the syllabus for the quiz dates). **There will be no makeup quizzes.**

◆ **Exams and exam policy:**

There will be three exams. Only the best 2 out of 3 exams will be counted toward the final grade of the course. Check exam dates in the course outline.

- Since you are already given an exam that you can drop for the final course grade, **no make-up exams will be made.**

• Only in very exceptional cases, students may be excused from missing an exam. Enough written evidence of the calamity must be provided. I will give make-up exams only when the conditions just specified are met. If a student does miss a test, the make-up test will be the 3rd exam at the end of the semester. If a student misses more than one exam without an extraordinary reason, her final grade will be reduced proportionately.

- Students requesting revision of an exam grade must submit their claim in writing, no later than two weeks after the exam grades have been distributed. Please include a brief argument/reasoning for grade change. For example, if you feel that your answers are correct but you did not get the credit, list reasons or evidence to support your argument

◆ **Empirical data Project:** You will be assigned a sequence of data projects throughout the semester and there will be a Stata test at the end of the semester. You are encouraged to use Stata for these projects because the instructor will provide specific help sessions for Stata. But you are allowed to use other statistical software. The policies for homework and exams specified above apply for these projects and test as well. Details of the data projects are available on the course website. We will also discuss these projects after the first software session in class.

◆ **Computing Software:** The statistical software package for this course is STATA, which is available on campus. But you are welcome to use other packages such as SAS, SPSS, Eviews, or TSP for the problem sets if you like. There will be “hand-on” STATA sessions at the beginning of the semester to aid you with the empirical problem sets and data projects.

◆ **Grading:**

The final grade will be a weighted average as follows:

Two best exams 30% each (total 60%)

Homework assignments 5%  
Empirical data project 20% (including a Stata Test 5%)  
Quizzes 10%  
Attendance and participation 5%

The course letter grades are determined as follows:

93 – 100	A	4.0
90 – 92.99	A –	3.67
87 – 89.99	B +	3.33
83 – 86.99	B	3.0
80 – 82.99	B –	2.67
77 – 79.99	C +	2.33
73 – 76.99	C	2.0
70 – 72.99	C –	1.67
67 – 69.99	D +	1.33
63 – 66.99	D	1.0
60 – 62.99	D –	.67
< 60	F	0

◆ **Attendance:** Academic work is the heart of the college experience and academic success at Agnes Scott College is directly related to class attendance. Attendance is part of the students' overall responsibility and performance in a given course. If you do not attend at least **two-thirds of the classes**, you will fail the course.

Attendance will be checked randomly and frequently throughout the semester. You are allowed to drop **two** no-show records at the end of the semester, but you will lose the attendance and participation credit for this class by **10** per cent for each additional no-show record. Since you are given the chance to drop two no-show records, no additional excuses will be granted for missing classes. Only in very exceptional cases (such as severe illness or family emergencies), students may be allowed to drop additional no-show records. Enough written evidence of the calamity must be provided. And in these cases of serious illness or injury or emergency that will require a student to miss academic work, she should notify the office of the dean of students (x6391) as soon as possible to inform the college of her situation. Late attendance will count only if you arrive within **5** minutes of the class start time. If you arrive later, it will count as **one-third** of an absence.

A student on academic probation is permitted only one absence in each academic course that is not due to serious illness, death of an immediate family member, and religious observance.

Students should leave class only during an extreme emergency; the instructor may stop class until the student returns.

◆ **Academic honesty** The Agnes Scott College honor code embodies an ideal of character, conduct, and citizenship, and is an important part of the College's mission and core identity. This applies especially to academic honesty and integrity. Passing off someone else's work as your own represents intellectual fraud and theft, and violates the core values of our academic community. To be honorable, you should understand not only what counts as

academic dishonesty, but also how to avoid engaging in these practices. You should:

- review each course syllabus for the professor's expectations regarding course work and class attendance.
- attribute all ideas taken from other sources; this shows respect for other scholars. Plagiarism can include portraying another's work or ideas as your own, buying a paper online and turning it in as if it were your own work, or not citing or improperly citing references on a reference page or within the text of a paper.
- not falsify or create data and resources or alter a graded work without the prior consent of your professor. This includes making up a reference for a works cited page or making up statistics or facts for academic work.
- not allow another party to do your work/exam, or submit the same or similar work in more than one course without permission from the course instructors. Cheating also includes taking an exam for another person, looking on another person's exam for answers, using exams from previous classes without permission, or bringing and using unauthorized notes or resources (i.e., electronic, written, or otherwise) during an exam.
- not facilitate cheating, which can happen when you help another student complete a take home exam, give answers to an exam, talk about an exam with a student who has not taken it, or collaborate with others on work that is supposed to be completed independently.
- be truthful about the submission of work, which includes the time of submission and the place of submission (e.g., e-mail, online, in a mailbox, to an office, etc.)

You should understand that penalties result from dishonest conduct, ranging from failure of the assignment to expulsion from the college. You should speak with your professors if you need clarification about any of these policies.

◆ **Policy on technology in the classroom**

Please do not use laptop computers or iPads in the classroom without my specific permission. If you want to make an audio recording of the class, you must get my permission before recording. I will not approve any video recording of class.

◆ **Disabilities:** Agnes Scott College seeks to provide equal access to its programs, services and activities for people with various abilities. If you will need accommodations in this class, please contact Kelly Deasy Roy in the Office of Academic Advising and Accessible Education ([404-471-6150](tel:404-471-6150)) to complete the registration process. Once registered, please contact me so we can discuss the specific accommodations needed for this course.

◆ **Course Evaluations:** Course evaluations are completed online. Near the end of the semester, you will receive an e-mail message that will provide a link to follow in order to complete the evaluation online, outside of class. Student evaluations provide feedback that is valuable to the instructor, and I hope that all members of the class will complete this form.

◆ **Title IX:** For the safety of the entire community, any incidence of or information about sexual misconduct must be reported immediately to Title IX Coordinator Marti Fessenden ([mfessenden@agnesscott.edu](mailto:mfessenden@agnesscott.edu), [404-471-6547](tel:404-471-6547)) or Deputy Title IX Coordinator Karen Gilbert ([kgilbert@agnesscott.edu](mailto:kgilbert@agnesscott.edu), [404-471-6435](tel:404-471-6435)).

◆**Diversity and Inclusion:** This course adheres to the principles of diversity and inclusion integral to the Agnes Scott community. We respect people from all backgrounds and recognize the differences among our students, including racial and ethnic identities, religious practices, and gender expressions. We strive for our campus to be a safe space in which all students feel acknowledged and supported. At the same time, we understand that course content, critical inquiry, and classroom dialogues give us opportunities to examine topics from a variety of perspectives. Such discourse is a defining feature of a liberal arts education, and can compel debates that challenge beliefs and positions, sometimes causing discomfort, especially around issues related to personal identities. While we uphold and preserve the tenets of academic freedom, we request and invite your thoughtful and constructive feedback on ways that we can, as a community of learners, respectfully assist and challenge one another in our individual and collective academic work.

## Reading List and Course Outline (tentative)

Week #			<u>Topic</u>	Readings:	Problem Sets:	
				<u>SW Ch. #</u>	<u>Posted</u>	
1	THU	Aug 25	Course Introduction/Economics Questions and Data	1		
2	TUE	Aug 30	Economic Questions and Data/Review of Probability	1/2		
	THU	Sep 1	Review of probability	2	PS#1	
3	TUE	Sep 6	Review of probability	2		
	THU	Sep 8	Review of Statistics	3	PS#2	
4	TUE	Sep 13	Review of Statistics	3		
	THU	Sep 15	Review of Statistics/Review of Stata (Data Cleaning and Basic Stata Commands) <b>Quiz 1</b>	3	Proj1	
5	TUE	Sep 20	Lab Session: Data Project 1			
	THU	Sep 22	Classic Linear Model: Bivariate	4/5	PS#3	
6	TUE	Sep 27	Classic Linear Model: Bivariate	4/5		
	THU	Sep 29	Classic Linear Model: Multiple <b>Quiz 2</b>	6	PS#4	
7	TUE	Oct 4	<b>Exam 1</b>	1-5		
	THU	Oct 6	<b>Fall Break (No Classes)</b>			
8	TUE	Oct 11	Classic Linear Model: Multiple	6/7		
	THU	Oct 13	Classic Linear Model: Multiple	6/7		
9	TUE	Oct 18	Lab Session: Data Project 2		Proj 2	
	THU	Oct 20	Nonlinear Regression Functions <b>Quiz 3</b>	8		

10	TUE	Oct 25	Assessing Multiple Regression	9	PS#5	
	THU	Oct 27	Assessing Multiple Regression	9		
11	TUE	Nov 1	Regression with Panel Data/Exam 2 Review <b>Quiz 4</b>	10	PS#6	
	THU	Nov 3	<b>Exam 2</b>	6-8		
12	TUE	Nov 8	Regression with Panel Data	10		
	THU	Nov 10	Regression with Panel Data	10		
13	TUE	Nov 15	Probit Model	11		
	THU	Nov 17	Lab session (library 211): Data project 3		Proj 3	
14	TUE	Nov 22	Lab session (library 211): Data project 4		Proj 4	
	THU	Nov 24	<b>Thanksgiving (no class)</b>			
15	TUE	Nov 29	<b>Stata Test</b> /Review of Exam 3			
	THU	Dec 1	<b>Exam 3</b>	9-11		
	TUE	Dec 6	Reading Day			