

ECO 5720
Applied Econometrics
Spring 2025

Instructor: Jayjit Roy

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Student Office Hours: Monday, Wednesday 11:00 a.m.-12:30 p.m. (in-person or via Zoom); Friday 11:00 a.m.-12:30 p.m. (via Zoom); and by appointment.

Communication Expectations: Please do not hesitate to email me with questions. I should be able to respond within 24 hours.

Course Description: The goal of this course is to equip students with the basic skills required to (i) ask empirical questions, (ii) conduct associated regression analyses, and (iii) interpret findings accurately. In addition to the basic concepts of linear regression, topics covered will include non-linear specifications, binary variables, heteroskedasticity, panel data, instrumental variables, and limited dependent variables. The statistical software *Stata* will be used, but no prior knowledge of the software is required.

Required E-Textbook and Software: *Introductory Econometrics: A Modern Approach-7th ed.*, by Jeffrey M. Wooldridge. The e-book is provided by Cengage Unlimited.

Other useful books include:

- *Causal Inference: The Mixtape*, by Scott Cunningham. The free online version is available at: <https://mixtape.scunning.com/>.
- *The Effect: An Introduction to Research Design and Causality*, by Nick Huntington-Klein. The free online version is available at: <https://www.theeffectbook.net/>.
- *Using R, Python and Julia for Introductory Econometrics*, by Florian Heiss. The free online version is available at: <https://urfi.net/>

Grading: Grades will be based on assignments, exams, a presentation, a paper, and class participation:

- Assignments will count for 20% of the course grade.
 - They must be submitted by specific due dates.
- Exams will count for 40%.
 - Two exams will count for 20% each.
 - Make-up exams will typically not be offered. If you are likely to miss an exam due to participation in a university-sponsored activity or religious observance, you should notify me in advance. In case of an emergency, see <http://academicaffairs.appstate.edu/syllabi>. For an excused missed exam, the make-up test should be taken before the next class meeting.
- A presentation will count for 15%.
 - You can present individually or form groups of two students. If you form a group, please notify me by April 9.
 - You will be given a dataset (e.g., *Log Into North Carolina*, *Quality of Government Data*, *World Development Indicators*, etc.) to estimate an empirical relationship; you can also use an alternative dataset that is approved by me. The presentation should address: (1) why the topic is interesting, (2) the choice of your estimation strategy, (3) the strengths of your empirical approach, (4) the drawbacks of your chosen method, and (5) one specific direction of future research.
 - Additional details on the presentation will be provided at least one month prior to the presentation date.

- In case of groups, if a student does not participate adequately, a penalty of at least 50% of the assigned points will be imposed.
- A paper related to the presentation will count for 15%.
 - It should address the points related to the presentation that are listed above
 - The length of the paper should not exceed 2000 words (excluding figures and tables).
 - It is due on the date of the presentation.
 - Please submit one paper per presentation. So, if you presented as a group, one joint submission is adequate.
 - In case of groups, if a student does not participate adequately, a penalty of at least 50% of the assigned points will be imposed.
- Class participation will count for 10%.
 - Throughout the semester, I will ask questions in class to make things interactive. Your responses will count towards this grade. I will typically use Poll Everywhere.
 - Your participation grade will be based on the proportion of questions that you participate in. For example, if there are 50 questions out of which you participate in 30, your participation will count for $(30/50) \times 10$, i.e., 6 in your final grade out of 100.
 - Although make-up polls will typically not be given, I will excuse 5 missed polls.

At the end of the semester, the final percentage mark will be converted into a letter grade based approximately on the following scale:

Percentage: Grade	Percentage: Grade	Percentage: Grade
93-100: A	83-86: B	73-76: C
90-92: A-	80-82: B-	65-72: C-
87-89: B+	77-79: C+	0-64: F

Please visit <http://academicaffairs.appstate.edu/syllabi> for university policies pertaining to academic integrity, disability accommodations, religious observance, and student engagement.

It is your responsibility to make sure that you are officially registered for this course. If you are not officially registered, please do not expect to be added late.

Statistical Software:

- <https://www.stata.com/order/new/edu/profplus/student-pricing/>
- <https://stats.idre.ucla.edu/stata/>
- <https://www.youtube.com/user/statacorp>

Class Schedule:

Material	Date
<u>Course Introduction</u>	January 13
<u>Chapter 1: Random Variables, Econometrics and Economic Data</u>	January 15
<u>Chapter 2: The Simple Regression Model</u>	January 22 and 27
<u>Chapter 3: Multiple Regression Analysis – Estimation</u>	January 29 and February 3

<u>Chapter 4: Multiple Regression Analysis – Inference</u>	February 5 and 10
<u>Chapter 5: Multiple Regression Analysis – OLS Asymptotics</u>	February 12
<u>Chapter 6: Multiple Regression Analysis – Further Issues</u>	February 17 and 19
<u>Chapter 7: Multiple Regression Analysis with Qualitative Information</u>	February 24 and 26
Exam 1 (on all topics covered so far)	March 3
<u>Chapter 8: Heteroskedasticity</u>	March 5
<u>Chapter 17: Limited Dependent Variable Models</u>	March 17 and 19
<u>Matching</u>	March 24 and 26
<u>Chapters 13 and 14: Pooled Cross Sections and Panel Data</u>	March 31 and April 2 and 7
<u>Chapter 15: Instrumental Variables</u>	April 9 and 14
<u>Other Methods</u>	April 16 and 21
<u>Other Methods</u>	April 23
<u>Discussion</u>	April 28
Exam 2 (on all topics covered since Exam 1)	April 30
Presentation and paper	May 5 at 11 AM

Note: The schedule above may have to be modified as the semester progresses.