ECO 5720
Applied Econometrics
Spring 2026

Instructor: Jayjit Roy
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Phone: 828.262.6242 (e-mail preferred)
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 *R* will be used, but no prior knowledge of the software is required.

Required E-Textbook and Software: *Introductory Econometrics: A Modern Approach-8th 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://urfie.net/
- *Causal Inference and Machine Learning: In Economics, Social, and Health Sciences*, by Mutlu Yuksel and Yigit Aydede. The free online version is available at: https://www.causalmlbook.com/.

Grading: Grades will be based on assignments, two exams, and two presentations:
- Assignments will count for 20% of the course grade.
  - They may involve homework and classwork.
  - The due dates for homework assignments will be announced in class.
  - Make-up opportunities for classwork will typically not be offered. If you are likely to miss class 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.
- 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.
- Two presentations will count for 40%.
  - You can present individually or form groups of two students. If you form a group, please notify me by February 9.

- The first presentation should discuss estimate an empirical relationship that you wish to estimate. It should address: (1) why the topic is interesting, (2) what data are available to answer the question, and (3) the choice of your estimation strategy. It will count for 15%.
- The second presentation should further discuss (1) the strengths of your empirical approach, (2) any concerns over endogeneity, (3) the drawbacks of your chosen method, and (4) one specific direction of future research. It will count for 25%.
- You will be given some sample datasets (e.g., *Log Into North Carolina*, *Quality of Government Data*, *World Development Indicators*, etc.). You can also use an alternative dataset that is approved by me.
- Additional details will be provided at least two weeks 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.

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.

It is your responsibility to stay up to date with announcements made and material covered in class.

Class Schedule:

Material	Date
Course Introduction	January 12
Chapter 1: Random Variables, Econometrics and Economic Data	January 14
Chapter 2: The Simple Regression Model	January 21 and 26
Chapter 3: Multiple Regression Analysis – Estimation	January 28 and February 2
Chapter 4: Multiple Regression Analysis – Inference	February 4 and 9
Chapter 5: Multiple Regression Analysis – OLS Asymptotics	February 11
Chapter 6: Multiple Regression Analysis – Further Issues	February 16 and 18

Chapter 7: Multiple Regression Analysis with Qualitative Information	February 23 and 25
Exam 1 (on all topics covered so far)	March 2
Chapter 8: Heteroskedasticity	March 4
Chapter 17: Limited Dependent Variable Models	March 16 and 18
Matching	March 23 and 25
Chapters 13 and 14: Pooled Cross Sections and Panel Data	March 30 and April 1 and 6
Chapter 15: Instrumental Variables	April 8 and 13
Other Methods	April 15 and 20
Other Methods	April 22
Discussion	April 27
Exam 2 (on all topics covered since Exam 1)	April 29
Presentation	May 4 at 11 AM

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