ECON 281: Introduction to Applied Econometrics

Fall 2024

MWF 1:00 PM - 1:50 PM, Harris Hall 107

Dr. Jeffrey T. Lewis (ECON)
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Office Hours: Monday 3:00-4:00, Tuesday 3:50-5:00, Thursday 3:50-5:00, Friday 3:00-4:00 (or by appointment)

Teaching Assistant	**Section Times/Locations**
TA Hellary Zhang	21: Tu, 5:00-5:50, Technological Institute M128
TA Eleftheria Kelekidou	22: Th, 5:00-5:50, Technological Institute LG52
TA Hellary Zhang	23/25: Tu, 6:00-6:50, Technological Institute M177
TA Eleftheria Kelekidou	24/26: Th, 6:00-6:50, Technological Institute A110

TA Eleftheria Kelekidou (eleftheriakelekidou2028@u.northwestern.edu)
TA Hellary Zhang (hellaryzhang2029@u.northwestern.edu)

TA office hours and locations will be posted on Canvas.

LEARNING OUTCOMES

In this class, students will: Increase their knowledge of both regression with one regressor and regression with multiple regressors. Familiarize themselves with Stata.

COURSE WEBSITE

This course has a website on Canvas. Everyone should automatically be enrolled in the Canvas website upon official enrollment in the class. I will post my lecture notes on the website by 5:00 pm the day before class. You should print out the materials and bring them to class. Problem sets, problem set solutions, and other materials will also be posted on the website. I will post announcements on the website stating what you should print out for class and when assignments are due.

TEXTBOOK AND CALCULATOR

The textbook for the course is *Introduction to Econometrics* by James H. Stock and Mark W. Watson. The textbook is optional. You can use the third edition, the third edition update, or the fourth edition. Some of the sections of the textbook will be posted on Canvas under Course Reserves. You will also need a calculator for this class. You can use any type of calculator. Bring your calculator to every class.

STATA

Some problem sets in this course will require you to use the statistical software, Stata. You need to have Stata on your computer. To purchase your own copy of the software for your computer, a six-month license for Stata/BE is available for $48 (click on the 6-month option). See https://www.stata.com/order/new/edu/profplus/student-pricing/ to purchase. Make sure you purchase Stata during the first week of class. You will be emailed a link to download Stata after you make the purchase.

SECTIONS

Some weeks during section, the TAs will answer questions if you have questions on the computer problem sets. Other weeks, the TAs might work through section problems (which will be similar to the questions on the problem sets).

CANVAS PROBLEM SETS
Some of the problem sets will be Canvas problem sets. You will need to submit numerical answers or answer multiple choice questions on Canvas. Canvas will automatically grade the problem sets. If you miss the deadline for submitting your answers, you will not receive credit for that problem set. For questions about how to complete the Canvas problem sets, read the policy_canvas_psets handout on Canvas (under Policies folder).

OFFICE HOURS
During office hours, you can't check over your Canvas problem sets. You need to complete those on your own. You can ask us questions about the course material or the section problems. You can ask us questions about the computer problem sets during office hours.

QUIZZES
We will give quizzes during lecture this term (not during section). The default is that the quizzes will be unannounced. The quizzes are closed-note quizzes (can't use any of your notes or devices). Bring your calculator to every class. Make sure you keep up with the course material.

EVALUATION
Here are the assessments that will be used to determine your final grade:

Problem Sets/ Quizzes
Exam #1
Exam #2
Final Exam

None of your problem set scores will be dropped. We will drop your lowest quiz score. At the end of the term, we will do this calculation:

$$[(\text{your PS points} + \text{your quiz points})/(\text{total PS points} + \text{total quiz points})]\times 100\%$$

This percentage score will constitute 13% of your final grade.

Your final grade will be determined by whichever calculation is highest (method *a*, *b*, or *c*):

a) 13%×(Problem Sets/Quizzes) + 29%×(Exam #1) + 29%×(Exam #2) + 29%×(Final Exam)
b) 13%×(Problem Sets/Quizzes) + 0%×(Exam #1) + 29%×(Exam #2) + 58%×(Final Exam)
c) 13%×(Problem Sets/Quizzes) + 29%×(Exam #1) + 0%×(Exam #2) + 58%×(Final Exam)

EXAM DATES
Exam #1 will be given in class on Friday, October 25.

Exam #2 will be given in class on Friday, November 22.

The Final Exam will be given on Thursday, December 12 from 9:00 AM – 11:00 AM.

You must take the Final Exam in our classroom on the date and time specified above.

EXCUSED ABSENCES/ MAKEUP POLICIES/ INCOMPLETES

<u>Canvas Problem Sets</u>

There are no makeup Canvas problem sets. If you miss the deadline for submitting your answers (for any reason), you will not receive credit for that problem set.

Quizzes

If you miss a quiz for an excused reason, such as illness, a family emergency, or travel with a University sports team, then you need to fill out the excused absence form on Canvas, staple your documentation (form stating you went to the Student Health Service, for example) to the back of the excused absence form, and hand everything in to me during the next lecture.

In the absence of documentation, an absence will be considered unexcused. If you miss a quiz for an unexcused reason, you will receive a 0 on that assessment. Missing class for a job interview, a job-related activity, an internship interview, an internship-related activity, any activity related to another class, or a family event would not constitute an excused absence.

We are going to drop your lowest quiz score. If you only miss one quiz and you miss that quiz because of an excused reason, that score will just be dropped. If you only miss two quizzes and you miss both quizzes for excused reasons, your first missing score will be dropped and your second missing score will be replaced with your Final Exam score. If you only miss two quizzes, and you miss one quiz for an excused reason and one quiz for an unexcused reason, your score from your excused absence will be dropped and your score of 0 from your unexcused absence will be counted.

Computer Problem Sets

You must hand in a hard copy of each computer problem set in class. If you miss class on the due date for an excused reason, bring the excused absence form and your documentation to the next class. Your missing score will be replaced with your Final Exam score.

Exam #1 and Exam #2

There are no makeup exams for Exam #1 or Exam #2.

If you miss Exam #1 (for any reason), but do take Exam #2 and the Final Exam, then your final grade will be determined by whichever calculation is highest: method *a*, *b*, or *c*.

If you miss Exam #2 (for any reason), but do take Exam #1 and the Final Exam, then your final grade will be determined by whichever calculation is highest: method *a*, *b*, or *c*.

If you miss both Exam #1 (for any reason) and Exam #2 (for any reason), but do take the Final Exam, then your final grade will be determined by whichever calculation is highest: method *a*, *b*, or *c*. (Please note that if you miss both Exam #1 and Exam #2, then withdrawing from the class might be your best option.)

Final Exam

If you take the Final Exam, or start to take the Final Exam, can you receive an excused absence for that exam?

No. If you take the Final Exam, or start to take the Final Exam, then you cannot receive an excused absence for that assessment. Your exam score will count, and it will be used to determine your final grade in the class. If you feel that you are too unwell to take the exam, do not take the exam. Instead, you should report in person to the Student Health Service or CAPS prior to the time of the exam.

Incompletes

If you take the Final Exam, or start to take the Final Exam, then you cannot receive an excused absence for that assessment. Your exam score will be recorded. You wouldn't qualify for an Incomplete.

If you miss the Final Exam for an excused reason (such as an illness or family emergency), then you would need to email me and then petition for an Incomplete through the Dean's Office.

To qualify for an Incomplete if you do not take the Final Exam:

1) The Dean's Office would have to approve your Incomplete petition.

2) You would have to have taken either Exam #1 or Exam #2. (If you miss both Exam #1 (for any reason) and Exam #2 (for any reason), then you would not qualify for an Incomplete.)

3) It has to be possible for you to receive a final course grade of at least 63% if you take the makeup Final Exam.

If you receive an Incomplete, then you would take the makeup Final Exam during finals week of the next term.

GRADING POLICIES

For questions on how to deal with rounding on problem sets and exams, read the policy_rounding handout on Canvas (under Policies folder). If a grading mistake was made on your exam, you need to give me your exam during the lecture following the lecture in which the exams were initially returned.

DETERMINING FINAL GRADES

Grading Scale #1 (minimum course score needed to achieve listed grade):

D	C-	C	C+	B-	B	B+	A-	A
63	70	73	77	80	83	87	90	93

Grading Scale #2 (minimum course score needed to achieve listed grade):

D	C-	C	C+	B-	B	B+	A-	A
63	70	73	77	80	83	87	90.5	93.5

Grading Scale #3 (minimum course score needed to achieve listed grade):

D	C-	C	C+	B-	B	B+	A-	A
63	70	73	77	80	83	87	91	94

Grading Scale #4 (minimum course score needed to achieve listed grade):

D	C-	C	C+	B-	B	B+	A-	A
63	70	73	77	80	83	87	91.5	94.5

Grading Scale #5 (minimum course score needed to achieve listed grade):

D	C-	C	C+	B-	B	B+	A-	A
63	70	73	77	80	83	87	92	95

Final course scores will be calculated. Tentatively, Grading Scale #1 will be used. If less than 50% of the class receives an A or A- using Grading Scale #1, then Grading Scale #1 will be used to determine final grades. If 50% or more of the class receives an A or A- using Grading Scale #1, then Grading Scale #1 will not be used to determine final grades.

Next, tentatively, Grading Scale #2 will be used. If less than 50% of the class receives an A or A- using Grading Scale #2, then Grading Scale #2 will be used to determine final grades. If 50% or more of the

class receives an A or A- using Grading Scale #2, then Grading Scale #2 will not be used to determine final grades.

Next, tentatively, Grading Scale #3 will be used. If less than 50% of the class receives an A or A- using Grading Scale #3, then Grading Scale #3 will be used to determine final grades. If 50% or more of the class receives an A or A- using Grading Scale #3, then Grading Scale #3 will not be used to determine final grades.

Next, tentatively, Grading Scale #4 will be used. If less than 50% of the class receives an A or A- using Grading Scale #4, then Grading Scale #4 will be used to determine final grades. If 50% or more of the class receives an A or A- using Grading Scale #4, then Grading Scale #4 will not be used to determine final grades. Instead, Grading Scale #5 will be used to determine final grades.

CLASSROOM POLICIES

Do not have your phone out during class. Do not have your computer open during class. Shut down your computer before we start class. Do not put your head down on the desk during class. If you are feeling unwell, you should report in person to the Student Health Service or CAPS.

If, through ANU, you are permitted to use a computer or tablet to take notes during class, have ANU email me that information as soon as possible at the beginning of the term.

If you want to take notes in class on a tablet, that's fine. You can do so.

NORTHWESTERN UNIVERSITY SYLLABUS STANDARDS

This course follows the Northwestern University Syllabus Standards. Students are responsible for familiarizing themselves with this information:

https://www.registrar.northwestern.edu/registration-graduation/northwestern-university-syllabus-standards.html

TENTATIVE TOPICS COVERED

Review of Statistics/ Review of Random Variables
Chapter 4- Linear Regression with One Regressor
Chapter 5- Regression with a Single Regressor: Hypothesis Tests and Confidence Intervals
Chapter 6- Linear Regression with Multiple Regressors
Chapter 7- Hypothesis Tests and Confidence Intervals in Multiple Regression
Chapter 8- Nonlinear Regression Functions
Randomized Control Trial
Instrumental Variables (Introduction)
Differences-in-Differences
Regression Matching Strategy
Chapter 11- Regression with a Binary Dependent Variable
Regression Discontinuity