Fall 9-1-2021

ECNS 403.01: Introduction to Econometrics

Douglas Dalenberg
University of Montana, Missoula, doug.dalenberg@umontana.edu

UNIVERSITY OF MONTANA
ECNS 403: Introduction to Econometrics

Course Information:
Semester: Fall 2021
Section: Section 01
Meeting time and Classroom: MWF 2:00-2:50 LA 207, W 1:00-1:50 FA 201
Credits: 4 credits
CRN: 70038

Instructor Information:
Instructor: Douglas Dalenberg
Office: LA 413
Email: doug.dalenberg@mso.umt.edu
Phone: 406-243-4406 (message only – email will get a faster response).
Office hours: MF 1:00-1:50, W 3:00-4:00 or by appointment.

Teaching Assistant:
TA: Trevor Finney
Office: LA 407 / 408A
Email: trevor.finney@umconnect.umt.edu
Office hours: R 1-4 (Zoom only), F 1-3.

Course Description:
This course is designed to develop undergraduate-level competency in econometric analysis with emphasis on interpretation and testing. Statistical software will be used to assist the student in handling of complex empirical problems and to demonstrate the use of statistical software in business and research environments. The ultimate objective of the course is to familiarize the student with the regression technique used in economics but also found in business, forestry, and other social sciences. I aim to help students develop a strong foundation for more advanced applications of econometrics in the future. This is an applied rather than theoretical econometrics course.

Prerequisites:
The prerequisite is an introductory statistics course.

Optional Text:
Wooldridge, Jeffrey M., 2020, *Introductory Econometrics: A Modern Approach,* 7th edition, Cengage. There is a one-year e-book option available.

Software:
R and RStudio. These are free, open source software. I will show you how to download it. If you do not have a computer on which to install this, you will have to use a University computer lab such as FA 210. You are required to wear a mask in University labs.

Course Moodle Page:
The course Moodle page will contain the course documents and data sets we use.

Learning Outcomes:

Students who successfully complete this course will be able to:

1. interpret regression results; this includes interpreting coefficient estimates and the related measures of fit.
2. explain the standard ordinary least squares assumptions and the consequences, detection, and potential corrections for violations of the standard assumptions.
3. perform and interpret the relevant hypothesis tests associated with the regression coefficients, model, fit, and violations of the ordinary least squares assumptions.
4. explain how to distinguish between practical and statistical significance.
5. demonstrate proficiency with a statistical software program.
6. identify situations in which methods such as logit or two-stage least squares are called for.

Assessment:

Assignment	Percent	Date (subject to change)
10 Homework	25%	9/15, 9/22, 9/29, 10/6, 10/13, 10/29, 11/5, 11/12, 11/19, 12/10.
10 Lab Assignments	25%	9/17, 9/24, 10/1, 10/8, 10/22, 10/29, 11/5, 11/12, 11/19, 12/10.
Midterm Exam	25%	Friday, October 15
Comprehensive Final Exam	25%	Tuesday, December 14 1:10-3:10.

I will use plus/minus grading with 100-92=A, 91-90=A-, 89-88=B+, 87-82=B, 81-80=B-, 79-78=C+, 77-72=C, 71-70=C- 69-68=D+, 67-62=D, 61-60=D-, 59 and below=F.

Graduate Increment:

Students taking this course for graduate credit are required to complete a graduate increment. I will pass out a separate graduate increment assignment. The graduate increment does not change your grade but must be completed in order to earn a grade in this class.

Policies:

Health

1. I will be following the University Covid-19 recommendations for classrooms. Currently they require a mask in class and labs and recommend masks indoors. The mask policy can be found on the Student Affairs website (http://www.umt.edu/student-affairs/community-standards/). Please make sure your mask covers your mouth and nose and is worn properly.
2. If my office hours conflict with your schedule, contact me for an appointment (in-person or Zoom). I will require masks in my office. If that does not work for you, we will meet over Zoom or outside.
3. Although attendance is not part of your course grade, attending class is important for your learning. I will be taking attendance and making a seating chart to assist with contact tracing but it is not a direct component of your grade.
4. Let's keep our classroom a healthy environment. Do not come to class if you are sick. If you feel sick and/or are exhibiting COVID-19 symptoms, please don't come to class and contact the Curry Health Center at (406) 243-4330. If you are a close contact with someone who tests positive, we will follow University policies. If I must miss class, I will notify you via email.
5. If you are required to isolate or quarantine, I will work with you to be sure you have access to

the recordings and handouts and I will meet with you over Zoom for questions you have.
6. UM (and I) recommend you get the COVID-19 vaccine. Please direct your questions or concerns about vaccines to Curry Health Center.

Classroom

1. In order to keep us safe, please no food or drinks in the classroom.
2. I will be recording the classes and posting the recordings on Moodle. The recordings are not a perfect substitute for attending class and there are some things such as class activities that the recording will miss but they can be a good resource. I will not be recording the lab sessions since those will focus on individual work.
3. If you miss the midterm and you contact me prior to or immediately after the exam, we will make arrangements for dealing with the missing score (usually a make-up exam). If I am not contacted promptly, then no make-up is possible.
4. Late homework and labs are penalized with a deduction of points reflecting the cost it imposes on me or my TA to grade it. Homework is considered late if I receive it after we have finished grading those assignments handed in on time. Late homework or labs cannot receive a grade higher than a C once I have returned those turned in on time. I waive the late penalty for excused absences, but you are still responsible for doing the homework and labs.
5. A classroom is a community, so I trust you will act as a mature and responsible citizen and treat each other with respect and courtesy. As one courtesy to your classmates, set your cell phones to vibrate and leave the class if you must take a call.

University

1. The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Office of Disability Equity, please contact them in Lommasson Center 154. I will work with you and the Office of Disability Equity to provide an appropriate modification. For more information, visit the Office of Disability Equity website (https://www.umt.edu/disability/).
2. All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code (http://www.umt.edu/student-affairs/community-standards/). Academic dishonesty will result in a score of zero for the work in question and possible university sanctions.
3. The University sets deadlines for adding classes, dropping classes, changing grade options, and changing to or from audit status. These policies can be found at the Registrar's web page (https://www.umt.edu/registrar/students/drop-add/default.php) while the actual dates for this term can be found on the Registrar's calendar (https://www.umt.edu/registrar/calendar/autumn-2021.php).
4. UM has a Cultural and Ceremonial Leave Policy which states: "Cultural or ceremonial leave allows excused absences for cultural, religious, and ceremonial purposes to meet the student's customs and traditions or to participate in related activities. To receive an authorized absence for a cultural, religious or ceremonial event the student or their advisor (proxy) must submit a formal written request to the instructor. This must include a brief description (with inclusive dates) of the cultural event or ceremony and the importance of the student's attendance or participation. Authorization for the absence is subject to approval by the

instructor. Appeals may be made to the Chair, Dean or Provost. The excused absence or leave may not exceed five academic calendar days (not including weekends or holidays). Students remain responsible for completion or make-up of assignments as defined in the syllabus, at the discretion of the instructor."

Calendar:

This schedule of topics is subject to modification. All changes will be announced in class.

Wk	Date	Topic	Labs	Assignments	Optional Reading
1	8/30 9/1 9/3	Overview R and RStudio R and RStudio	Lab not graded		Wooldridge ch 1
2	9/6 9/8 9/10	*Holiday* Stat Review: Measures Stat Review : Properties	Lab not graded		
3	9/13 9/15 9/17	Regression: Notation Regression: Line Fitting Regression: Interpretation	Lab 1 due	Hmk 1 due	Wooldridge ch 2 Wooldridge ch 3
4	9/20 9/22 9/24	Regression: Assumptions Regression: Std errors Regression: Multicollinearity	Lab 2 due	Hmk 2 due	Wooldridge ch 4
5	9/27 9/29 10/1	Inference: F test Inference: Partial F test Inference: t test	Lab 3 due	Hmk 3 due	
6	10/4 10/6 10/8	Inference: Extensions Further Issues: Slope and Elas. Further Issues: Log models	Lab 4 due	Hmk 4 due	Wooldridge ch 6
7	10/11 10/13 10/15	Further Issues: Quadratics Further Issues: Stdized betas Midterm Exam	Lab not graded	Hmk 5 due	
8	10/18 10/20 10/22	Qualitative Information: Basics Qualitative Information: Log Qualitative Information: Ext.	Lab 5 due		Wooldridge 7.1-7.4
9	10/25 10/27 10/29	Heteroskedasticity: Detection Heteroskedasticity: Correction Outliers	Lab 6 due	Hmk 6 due	Wooldridge 8.1-8.3
10	11/1 11/3 11/5	Specification: Misspecification Specification: Proxy Finding and Getting Data	Lab 7 due	Hmk 7 due	Woold 9.1, 9.2, 9.4 9.5
11	11/8 11/10 11/12	Data Cleaning 1 Data Cleaning 2 Time Series Issues: Models	Lab 8 due	Hmk 8 due	Woold. 10.1-10.2, 10.5
12	11/15 11/17 11/19	Serial Correlation: Detection Serial Correlation: Correction LPM and Logit	Lab 9 due	Hmk 9 due	Wooldridge 12.1-12.3 Wooldridge 17.1
13	11/22 11/24 11/26	Logit *Travel Day* *Holiday*	No Lab		
14	11/29 12/1 12/3	Causality in Econometrics Causal Methods Panel: Fixed Effects	Lab not graded		Wooldridge 13.1, 14.1
15	12/6 12/8 12/10	Endogeneity IV Methods IV Methods	Lab 10 due	Hmk 10 due	Wooldridge 15.1-15.3
16	12/14 (Tues.)	Final Exam 1:10-3:10			