ECON 409-001

Syllabus for Intermediate Econometrics (Rev. 0)

ECON 409 (Rev. 0)	**TR 2:00 to 3:15 PM**	**Econ 1004**

INSTRUCTOR:	Dr. Dave Dixon Econ 2032 (505) 886-1811 ddixon@unm.edu See **Canvas** for Student Drop-in hours.	**STANDBY INSTRUCTOR:**	Dr. Claudia Diaz Fuentes (505) 277-5304 claudiadf@unm.edu See **Canvas** for Student Drop-in hours.
DEPARTMENT:	Economics Economics Bldg (#57) (505) 277-5304		Canvas: **ECON-409-001 (Spring 2023)**

COVID-19 Special Considerations

UNM Administrative Mandate on Required Vaccinations
UNM requires COVID-19 vaccination and a booster for all students, faculty, and staff, or an approved exemption. For details, see UNM Administrative Mandate on Required Vaccinations).
UNM Requirement on Masking in Indoor Spaces
Starting July 5, 2022, UNM is recommending that masks be worn indoors at al UNM campuses. The University, City, County, or State may modify mask requirements at any time based on changing rates of COVID-19 infection. Check https://bringbackthepack.unm.edu/index.html regularly.
COVID-19 Symptoms and Positive Test Results
Please do not come to a UNM campus if you are experiencing symptoms of illness, or have received a positive COVID-19 test (even if you have no symptoms). Contact your instructors and let them know that you should not come to class due to symptoms or diagnosis. Students who need support addressing a health or personal event or crisis can find it at the Lobo Respect Advocacy Center.
Communication on change in modality
The President and Provost of UNM may direct that classes move to remote delivery at any time to preserve the health and safety of the students, instructor and community. Please check Canvas regularly for updates about our class and please
check https://bringbackthepack.unm.edu regularly for general UNM updates about COVID-19 and the health of our community.
Acceptable masks and mask wearing in class
A two-layer mask that covers the nose and mouth and that is cleaned regularly is acceptable, as are disposable medical masks, KN95, KF94, FFP1 and FFP2 masks. A face shield is not sufficient protection. It is vital that you wear your mask correctly, covering your nose and mouth. Removing your mask for an extended period to eat or drink in class violates the university mask requirement and endangers others.

Standby instructor
In the event that the regular instructor contracts COVID-19 and must remain off campus during recovery, a standby instructor will take over the class during that time. Do not contact the standby instructor with questions about this class unless that instructor is actually teaching the class.

COURSE DESCRIPTION

In introductory econometrics, you learned the basic theory of ordinary least squares (OLS) and gained a little experience using it for the classical linear regression model (CLRM). In this course we will examine the problems that arise when real-world data violate the basic assumptions of the CLRM. In the lab we will explore ways to diagnose the common data problems of heteroskedasticity, multicollinearity, and autocorrelation, and to correct for them when we can. We will also touch on problems with time series data, simultaneous equations, and dichotomous dependent variables. This is primarily a techniques course with very little theory beyond reviewing the assumptions of OLS and CLRM.

COURSE OUTLINE

Topics covered in this course:

- Introduction (weeks 1 and 2)

    – About this course
    – OLS review

- Econometric pathologies (weeks 3 through 10)

    – Functional form and specification bias
    – Multicoliearity and heteroskedasticity
    – Autocorrelation (serial correlation)
    – Unit root, spurious regression, conintegration

- Some advanced topics in econometrics (weeks 12 through 16)

    – Instrumental variables
    – Panel data
    – Logit

COURSE FORMAT

Web Enhanced Lecture: This means regular class meetings (lectures) plus Canvas for homework, communication and administration. Administration includes announcements, assignment due dates, special readings and online discussions. Administration also includes course progress and grades. You will need your UNM NetID (login) to use Canvas.

> **Using Canvas**
>
> Go to https://canvas.unm.edu/. After you login, your Dashboard should include
>
> **ECON-409-001 (Spring 2023)**
>
> To find out more about Canvas, click the Help link on the left side menu of your Canvas page.

Schedule

The official course schedule is posted in Canvas and is subject to change. Check it often.

COURSE LEARNING OBJECTIVES (CLOs)

After successful completion of this course, students will be able to apply appropriate theoretical models and use various data sources to:

1. Define autocorrelation, cointegration, heteroskeadasticity, and multicolinearity.

2. Analyze a data set for autocorrelation, cointegration, heteroskeadasticity, and multicolinearity.

3. Assess the options for correcting autocorrelation, cointegration, heteroskeadasticity, and multicolinearity in a given data set.

4. Compose an econometric analysis which includes estimation of autocorrelation, cointegration, heteroskeadasticity, and multicolinearity and corrections if applicable.

5. Demonstrate two-stage OLS using instrumental variables.

6. Construct an econometric analysis on panel data.

7. Demonstrate correct use of logit estimation.

PREREQUISITES

To enroll, a student must have completed ECON 309 Introductory Statistics and Econometrics or equivalent with a grade of C or better. A good working knowledge of arithmetic, algebra, and basic calculus are assumed.

TECHNICAL SKILLS

In order to participate and succeed in this class, you will need to be able to perform the following basic technical tasks:

• Use UNM Canvas (help documentation located in Help link on left course menu, and also at https://canvasinfo.unm.edu/).

• Use Canvas Inbox – including attaching files, opening files, downloading attachments

- Copy and paste within applications including Microsoft Office.

- Open a hyperlink (click on a hyperlink to get to a website or online resource).

- Download and read PDF documents. Save PDF documents from Word or other word processing application.

- Use a word processing application such as LyX, OpenOffice or LibreOffice Writer, or Microsoft Office Word that outputs PDF documents.

- Create and edit equations in the word processing application of choice (Equation Editor in Word, OpenOffice or LibreOffice Writer; equation and equationarray environments in LyX)

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- Copy and paste within applications including Microsoft Office, LibreOffice, or OpenOffice.

- Use of an R compiler and R editor like RStudio

- Use of Stata

- Save PDF documents from Microsoft Office, OpenOffice, or LibreOffice.

TECHNICAL REQUIREMENTS

Computer

As an in–person class, this course does not require the student to own a personal computer. All of the computer-based activities can be completed on computers publicly available on campus, although Stata is only generally available in the computer lab in the Economics Building. As a computer-intensive course, however, the student will find it most convenient to have ready access to a computer (desktop or laptop) with all of the following capabilities.

- A supported browser (either Firefox or Chrome).

- Any computer capable of running a recently updated web browser should be sufficient to access your online course. However, bear in mind that processor speed, amount of RAM and Internet connection speed can greatly affect performance. Many locations offer free high-speed Internet access including UNM's Computer Pods (http://it.unm.edu/pods/locations.html).

- Word processing software for formatting Lab reports:

  – Microsoft Office products are available free for all UNM students (more information on the UNM IT Software Distribution and Downloads page: http://it.unm.edu/software/index.html)

  – LyX is available free for download from https://www.lyx.org/Download

  – OpenOffice is available free for download from https://www.openoffice.org/download/

- – LibreOffice is available free for download from
  https://www.libreoffice.org/download/download/

- Both R/RStudio and Stata for Labs:

  - – R is becoming a standard in academic and professional circles. It is available in
    multiple computer pods on campus, including the computer lab in the Economics
    Building. For your personal computer, R and RStudio are free:
    - * Download and install R first from https://cran.rstudio.com/.
    - * Then download and install RStudio from
      https://rstudio.com/products/rstudio/download/#download.

  - – Stata is the most professional econometric software. It is standard in graduate
    programs and at large firms. It is available in the computer lab in the Economics
    Building. For your personal computer:
    - * Stata is available to students for as little as $48 for a six month license. See
      https://www.stata.com/order/new/edu/gradplans/student-pricing/.

**For UNM Canvas Technical Support: (505) 277-0857 (24/7) or go to
https://canvasinfo.unm.edu/.**

Tracking Course Activity UNM Canvas automatically records all students' activities including:
your first and last access to the course, the pages you have accessed, the number of discussion
messages you have read and sent, web conferencing, discussion text, and posted discussion
topics. This data can be accessed by the instructor to evaluate class participation and to identify
students having difficulty.

Reading

If the schedule shows reading due for a class meeting, that reading must be completed before
arriving for that class. Students will be selected at random to present a synopsis of the reading
which will count toward class participation.

Canvas Down or System-wide Failure

If Canvas is unexpectedly unavailable for a significant amount of time and/or at the time
assignments are due the instructor will send an email via LoboMail and extend the deadline when
Canvas becomes available. In the event of a system-wide failure that includes LoboMail, the
instructor will make adjustments to the schedule as appropriate and announce them when the
system becomes available.

Lab Reports

If the schedule shows a Lab Report due on a date, the Lab Report is due before 11:59 PM on the
due date. Lab Reports turned in late will have the credit reduced by five percent for each day late
(which compounds quickly - see https://en.wikipedia.org/wiki/Compound_interest). The grader

may ask you to revise your report, in which case there is no late penalty, provided it is resubmitted before the next Lab Report is due. There really is no time to catch up in this course, so I reserve the right to drop any student with an assignment that is more than a week overdue unless that student has made other arrangements. Lab reports must be submitted as a PDF.

Participation

Students are expected to participate in discussions, in-class problem solving and exercises, and online discussions. Credit for this course includes a participation component (see COURSE REQUIREMENTS below), which can be either positive or negative. For example, frequent absence reduces the opportunities for participation and may result in negative participation credit. Similarly, disrespectful conduct, either in the classroom or online, will not be tolerated and will result in negative participation credit.

TEXTBOOK AND SUPPLEMENTAL MATERIALS

Assignments are due beginning the first day. It is the student's responsibility to have all the required material before the course starts.

Required Textbook

Introductory Econometrics: A Modern Approach, 4e or later, by Jeffrey M. Wooldridge. Cengage Learning. This is an excellent book to keep with you throughout your carreer. Some of the topics can be found in another textbook you may have. Cross-references are provided in Canvas for these textbooks:

Real Econometrics: The Right Tools to Answer Important Questions
    by Michael A. Bailey. Oxford University Press.

Essentials of Econometrics, 3e or later
    by Domodar Gujarati and Dawn Porter. McGraw-Hill Publishing.

Introduction to Econometrics, 3e or later
    by James H. Stock and Mark W. Watson. Pearson Publishing.

Required Supplementary Materials

You will do your Labs for this course in both R **and** Stata. You should definitely install R and RStudio on your own computer. You may choose to purchase and install Stata ($48 for a 6-month license) or you can use Stata in the computer lab. There will be plenty of time in the computer lab to do at least the Stata part of each lab.
You will find instructions for installing R and RStudio on our Canvas page. There will also e a link for purchasing Stata.

Exams

In 100-200 level courses, exam questions will be nearly identical to homework problems. In 300-level courses, exam problems will be similar to homework with some expectation that the student will be able to adapt to changes in numerical values or answer components (e.g. homework asked for equilibrium quantity, exam asks for equilibrium price, or exam problem combines multiple problems from the problem sets). In 400-level courses, exam problems will address the same topics as homework, with the expectation that students are able to extrapolate from familiar applications to similar but unfamiliar applications. I will typically warn you if something in class is likely to appear on an exam, but it is possible that something from the reading will appear on an exam that hasn't been discussed in class.

JITT

JITT (just-in-time teaching) is way for students to have some control over the curriculum. When you do the required reading, most of what you read will be clear to you, but a few things would be clearer with some discussion. To ensure that students take responsibility for this control, you will be required to make a post to the JITT discussion in Canvas *at least* once each week. JITT posts can include questions or comments about the homework or an exam question, or to make constructive comments in reply to a post by another student.

ONLINE CONTENT

This course will include online content posted on Canvas. **Please do not leave online work to the last minute – assignments missed due to technical difficulties will receive the highest level of sympathy, but no grade allowances.**

COURSE REQUIREMENTS

		Grading (% of total grade)
EXAMS	2 progressive exams (not cumulative, but subsequent exams will build on the material from earlier ones.)	(25%)
FINAL PROJECT	Each student will select a data-intensive project. The student will have to propose a project, to collect and condition data, complete multiple tests for bias and other problems, present the project in the last week of class, and submit a final report during finals week.	(25%)
LABS	8 lab assignments **Late assignments will have 5% credit reduced for each day late**	(25%)
PARTICIPATION	All students are expected to participate in solving problems in class, in-class exercises, and general discussions. This includes participating in JITT discussions.	(25%)

COMMUNICATION

The instructor and TA(s) will use Canvas Announcements for general communication. For questions or discussion about the course and its content, the best time to communicate is in class. Outside of class, the best way for you to communicate is through Canvas on either the JITT discussion (see the section above) or the Inbox tool (more on that below).

✳ If you have a question about the course, please review this document first as most questions have already been answered here.

If you have a question about the course content or something that is not answered in this document, please first post your question to the JITT discussion in Canvas. When you post on the JITT discussion, the teaching team is notified by email. By asking and answering questions on this shared discussion, it will considerably shorten the response time for you and for other students with the same question. You can subscribe to the discussion by navigating to it then clicking the Subscribe button.
Never send an Inbox message to all Teaching Assistants. Some of the people listed as Teaching Assistants are actually UNM support people or other instructors observing the course. You should only communicate directly with a TA when that TA has contacted you first. In almost all cases, contact the instructor and no one else.

Canvas Inbox/Email

Of course, if you have a confidential matter to discuss (e.g., your grade), please use Canvas Inbox. We use Inbox to protect your confidentiality and to have a reliable record of communication. For these reasons, the instructor will not respond to any email messages except in an emergency (e.g. a natural disaster, not "I forgot to do the assignment").

GETTING SUPPORT

Student Drop-in Hours, Appointments, and CAPS Online Tutoring

The instructor and TA(s) will hold regularly scheduled Student Drop-in Hours hours. Campus drop-in hours are located on UNM's main campus in the Economics Building (#57). See Canvas for drop-in hour schedules, office locations, and contact info. CAPS provides statistics helps.Also, always feel free to set up an appointment with the instructor.

Canvas Technical Support

If you have a Canvas technical difficulty, but are able to login to Canvas, please click the Help link from our course page. If you are unable to log in to Canvas, please contact Canvas technical support at (https://canvasinfo.unm.edu/support/index.html) or phone 505-277-0857 (1-877-688-8817 outside Albuquerque).

GRADING POLICY

Your final grade will be determined from the table below, rounding your Course Average to the nearest whole percent - **NO EXCEPTIONS**. A student will receive an A+ grade only if the score is 96% or above before extra credit.

Course Average	Grade	Course Average	Grade	Course Average	Grade	Course Average	Grade
$\geq$ 96%	A+	86-89%	B+	76-79%	C+	66-69%	D+
93-95%	A	83-85%	B	73-75%	C	63-65%	D
90-92%	A-	80-82%	B-	70-72%	C-	60-62%	D-

A Course Average below 60% is a failing grade.

ACCOMMODATION STATEMENT

Accessibility Services (Mesa Vista Hall 2021, 277-3506, http://as2.unm.edu/) provides academic support to students who have disabilities. If you think you need alternative accessible formats for undertaking and completing coursework, you should contact this service right away to assure your needs are met in a timely manner. If you need local assistance in contacting Accessibility Services, see the Bachelor and Graduate Programs office. **NOTE:** Students planning to take exams at the ARC must schedule those exams **more than one week** before the exam day. Otherwise it may not be possible to accommodate the exam request. Exam dates are published at the beginning of the semester: make your appointments then.

UNM POLICIES

Accommodations

In accordance with University Policy 2310 and the Americans with Disabilities Act (ADA), academic accommodations may be made for any student who notifies the instructor of the need for an accommodation. It is imperative that you take the initiative to bring such needs to the instructor's attention, as I am not legally permitted to inquire. Students who may require assistance in emergency evacuations should contact the instructor as to the most appropriate procedures to follow. Contact Accessibility Resource Center at 277-3506 or arcsrvs@unm.edu for additional information.

UNM is committed to providing courses that are inclusive and accessible for all participants. As your instructor, it is my objective to facilitate an accessible classroom setting, in which students have full access and opportunity. If you are experiencing physical or academic barriers, or concerns related to mental health, physical health and/or COVID-19, please consult with me after class, via email/phone or during Student Drop-In Hours. You are also encouraged to contact Accessibility Resource Center at arcsrvs@unm.edu or by phone 277-3506. Accessibility statements:

- Canvas: https://www.instructure.com/products/canvas/accessibility

- Microsoft: https://www.microsoft.com/enable/microsoft/mission.aspx

Credit-hour statement

This is a three credit-hour course. Class meets for 30 sessions of direct instruction for fifteen weeks during the Spring 2023 semester. Students are expected to complete a minimum of six hours of out-of-class work (homework, study, assignment completion, and class preparation) each week.

Title IX

Our classroom and our university should always be spaces of mutual respect, kindness, and support, without fear of discrimination, harassment, or violence. Should you ever need assistance or have concerns about incidents that violate this principle, please access the resources available to you on campus, especially the LoboRESPECT Advocacy Center and the support services listed on its website (http://loborespect.unm.edu/). Please note that, because UNM faculty, TAs, and GAs are considered "responsible employees" by the Department of Education, any disclosure of gender discrimination (including sexual harassment, sexual misconduct, and sexual violence) made to a faculty member, TA, or GA must be reported by that faculty member, TA, or GA to the university's Title IX coordinator at the Office of Compliance, Ethics, and Equal Opportunity. For more information on the campus policy regarding sexual misconduct, please see: https://policy.unm.edu/university-policies/2000/2740.html.

Citizenship and/or Immigration Status

All students are welcome in this class regardless of citizenship, residency, or immigration status. Your professor will respect your privacy if you choose to disclose your status. As for all students in the class, family emergency-related absences are normally excused with reasonable notice to the professor, as noted in the attendance guidelines above. UNM as an institution has made a core commitment to the success of all our students, including members of our undocumented community. The Administration's welcome is found on our website: http://undocumented.unm.edu/.

Land Acknowledgement

Founded in 1889, the University of New Mexico sits on the traditional homelands of the Pueblo of Sandia. The original peoples of New Mexico Pueblo, Navajo, and Apache since time immemorial, have deep connections to the land and have made significant contributions to the broader community statewide. We honor the land itself and those who remain stewards of this land throughout the generations and also acknowledge our committed relationship to Indigenous peoples. We gratefully recognize our history.

Copyright Issues

All materials in this course fall under copyright laws and should not be downloaded, distributed, or used by students for any purpose outside this course. Misuse is subject to disciplenary procedures.

Doing the Right Thing

UNM has policies to preserve and protect you and the academic community available in the Student Pathfinder as well as in the Faculty Handbook. These include policies on student grievances D175 (undergraduates) and D176 (graduate and professional students), academic dishonesty (D100), and respectful campus (CO9). Please ask for help in understanding and avoiding plagiarism (passing the work or words of others off as your own work or words) or other forms academic dishonesty. Doing something dishonest in a class or on an assignment can lead to serious academic consequences. Come talk with me about your concerns or needs for academic flexibility or talk with support staff at one of our student resource centers before you do something that may endanger your career.

Drop Policy

Please contact the instructor via Inbox if you feel that dropping this course will best serve your academic career.
UNM Policies: This course falls under all UNM policies for last day to drop courses, etc. Please see http://www.unm.edu/studentinfo.html or the UNM Course Catalog for information on UNM services and policies. Please see the UNM academic calendar for course dates, the last day to drop courses without penalty, and for financial disenrollment dates.

ELECTRONIC DEVICES IN CLASS

Laptops, tablets, smartphones, MP3 players, etc. must be used with consideration. In particular, students using laptops are encouraged to sit at the back of the lecture hall so they do not distract other students. Any student whose electronic device appears to be distracting other students will be asked to terminate use.

UNM RESOURCES

Accessibility Resource Center (ARC)   http://as2.unm.edu/

CAPS Tutoring Services   http://caps.unm.edu/programs/online-tutoring/
CAPS is a free-of-charge educational assistance program available to UNM students enrolled in classes. Online services include the Online Writing Lab, Chatting with or asking a question of a tutor.

Lobo Food Pantry   https://loborespect.unm.edu/services/campus-lobo-food-pantry.html

Student Health & Counseling (SHAC)   https://shac.unm.edu/

UNM Libraries   http://library.unm.edu

REAL WORLD DATA

The data sets used in exercises for this course come from textbook authors who have selected them for a specific reason: they work. Some students ask to do a project using real-world data, and I remind them of what Josiah Stamp (appointed director of the Bank of England in 1928) once said: "The government are very keen on amassing statistics. They collect them, add them, raise them to the nth power, take the cube root and prepare wonderful diagrams. But you must never forget that every one of these figures comes in the first instance from the village watchman, who just puts down what he damn pleases."