

Economic Tools
ECON 307
Fall 2016
TR 3:30-4:45
CTLB 330

Instructor: Kristina Piorkowski

Office Hours: Monday 10:00-11:00 and Thursday 2:00-3:00, or by appointment

TA: Aakrit Joshi (Office Hours: TBA, check Learn)

Course Website: <http://learn.unm.edu> - log in with your UNM NetID

Course Description: This course introduces students to the mathematics, data, and writing skills essential for understanding, interpreting, and communicating economic concepts. It is held one of UNM's Learning Studio classrooms. The first half of the course is devoted to the math most commonly used in economics. Topics covered are equations, graphs, and formulas; solving for equilibria; comparative statics analysis; single-variable differentiation and optimization; and multi-variable differentiation. Each math topic is accompanied with microeconomic and macroeconomic applications. The second half of the course will cover data analysis and writing skills. Students will compile and analyze data in Excel and then write up their findings in a research paper that follows conventions used by professional economists.

Prerequisites and Co-requisites: ACT \geq 26, SAT \geq 600, MATH 121, MATH 150, or Compass College Algebra $>$ 66. Pre- or Co-requisites: ECON 105 or ECON 106. This course can be used as a co- or pre-requisite for Econ 300 & Econ 303. Your other option is to take Calculus (Math 180 or Math162). If you want to go to graduate school in Economics, you *definitely* need take Calculus, whether or not you take Econ 307!

Required Materials:

Mathematics for Economics and Business by Ian Jacques (editions 5, 6, or 7 are acceptable)

- The 7th edition (ISBN 13: 978-0273763567) is available at the UNM bookstore.
- You can purchase the other editions online (e.g., Amazon) or rent it (e.g.,bookbyte.com).
- You do not need the MyMathLab Access Card.

The Elements of Style by William Strunk and E.B. White (any edition). New York: Macmillan, various years.

Additionally, students are required to have a calculator, consistent and reliable access to Internet, and basic Microsoft Excel skills.

Optional Materials:

The Craft of Research by Wayne C. Booth, Gregory G. Colomb, and Joseph M. Williams (3rd Edition. ISBN: 978-0226065663). Chicago: University of Chicago Press, 2008.

Course Structure: Students focus on a new topic each week. Prior to coming to the first

class each week, you will need to familiarize yourself with the material by:

- Reviewing learning materials (e.g., required readings, narrated lectures, etc.)
- Completing a pre-lab quiz on your own that helps you focus on the most essential information from the learning materials. For the math portion, you also complete a post-assessment quiz to make sure you can work through lab-like problems on your own. You must complete the pre-lab quiz and the post-assessment quiz via Learn, by Sunday at 11:59 pm. The quizzes always include a “muddy points” question: What would you like the instructor to spend some more time on in class?

Class time is dedicated to collaborative lab assignments. A typical non-exam week looks like this:

- On the **weekend** you are expected to do the following at home:
 - Complete post-assessment quiz (based on previous lab)
 - Do assigned reading, watched narrated lectures, and take notes
 - Take pre-lab quiz on basics covered by reading and lecture, and indicate muddy points
 - Preview upcoming lab
- In class, on **Tuesdays** and **Thursdays**, you can expect:
 - The instructor will clarify muddy points
 - You will work on the lab with your team
 - Work across groups to share ideas

Course Objectives: After successful completion of this course, students will have the math skills (1 - 6) and data and writing skills (7 - 12) to be able to:

1. Define the scientific method.
2. Interpret common economic graphs and formulas.
3. Distinguish between movements and shifts of graphs.
4. Solve economic problems using algebraic and graphical analysis.
5. Discuss the connection between marginal analysis, calculus, and the ceteris paribus assumption.
6. Differentiate common economic functions (e.g., production functions, utility functions) to find and interpret their marginal values.
7. Locate and access high quality data and literature pertaining to economics.
8. Manage data in excel.
9. Identify, characterize, and evaluate economic measurements.
10. Develop and test simple analytical models.
11. Interpret summary statistics and regression results.
12. Express economic concepts, methods, and findings verbally and in writing using the citation style, organization, and formatting conventions that are standard in the field of economics.

Attendance: Each unexcused absence during the week results in a proportionate reduction for that week’s lab grade. If you miss one class, your lab grade for that week will be reduced by 50%.

Course Grades: There are four components that comprise the course grade in ECON 307: online quizzes (15%), in-class labs (40%), exams (22.5%), and a writing assignment and presentation (22.5%).

1. *Online quizzes:* You will complete pre-lab quizzes and post-assessment quizzes (for the math portion) via Learn. The pre-lab quizzes focus on main concepts and definitions from the readings and lectures and prepare you for the labs. The post-assessment quizzes test your knowledge of the lab material. Quizzes are submitted individually via Learn, by Sunday, 11:59pm. You are given two attempts per quiz and the higher of the two grades will be recorded. There is no time limit so you can save the quiz and go back to it later.
2. *In-class labs:* You and your group members will complete in-class labs that focus on critical thinking and application problems (in the first 8 weeks) and on data analysis and writing skills (in the second 8 weeks). Labs are submitted as a group at the end of class on Thursday. During exam weeks, labs are submitted the class before the exam.
3. *Exams:* You will complete two exams during the math portion of the course, and one exam during the data and writing portion of the course. Exams are taken in-class and submitted individually.
4. *Writing Assignments and Presentation (Data & Writing Portion):* You will complete one writing assignment and give a presentation to the class. The paper will be based on the data collection and analysis activities you perform with your group during the in-class labs. Writing assignments are to be submitted individually. Final papers are due by 11:59pm on Thursday, December 8th on Learn. Each student will present his or her paper individually during the scheduled final exam period. Points for this project are distributed as follows: 15% for the final paper and 7.5% for the corresponding presentation.

The following grading scale will be used to determine your final course letter grade- NO EXCEPTIONS.

| Percentage | Letter Grade |
|------------|--------------|
| 98-100%* | A+ |
| 92-97.99% | A |
| 90-91.99% | A- |
| 88-89.99% | B+ |
| 82-87.99% | B |
| 80-81.99% | B- |
| 78-79.99% | C+ |
| 72-77.99% | C |
| 70-71.99% | C- |
| 68-69.99% | D+ |
| 62-67.99% | D |
| 60-61.99% | D- |
| < 60% | F |

*Without extra credit.

Makeup/Late Assignment/Extra Credit: No make-up or late assignments or make-up exams will be accepted. Labs are to be turned in during class as a group.

Academic Dishonesty Policy (from UNM's Student Handbook Pathfinder): Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, up to and including dismissal, against any student who is found guilty of academic dishonesty or otherwise fails to meet the standards. Any student judged to have engaged in academic dishonesty in course work may receive a reduced or failing grade for the work in question and/or for the course. Academic dishonesty includes cheating on individual assignments and exams, and plagiarism. Students will learn more about how to avoid plagiarism in the Data and Writing section of the course. See the handbook for more details about UNM's policies.

Accommodation Statement (from UNM's Student Handbook Pathfinder): In keeping with the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, the University is committed to providing equal access to education opportunities for qualified students with disabilities. The University's Accessibility Resource Center (Mesa Vista Hall 2021, 277-3506) provides academic support to students who have disabilities. The student is responsible for demonstrating the need for an academic adjustment by providing the Accessibility Resource Center with complete and appropriate current documentation.

In an effort to meet obligations under Title IX, UNM faculty, Teaching Assistants, and Graduate Assistants are considered "responsible employees" by the Department of Education (see pg 15 - <http://www2.ed.gov/about/offices/list/ocr/docs/qa-201404-title-ix.pdf>). This designation requires that any report of gender discrimination which includes sexual harassment, sexual misconduct and sexual violence made to a faculty member, TA, or GA must be reported to the Title IX Coordinator at the Office of Equal Opportunity (oeo.unm.edu). For more information on the campus policy regarding sexual misconduct, see: <https://policy.unm.edu/university-policies/2000/2740.html>

Please note that UNM has three offices that you can report incidents and concerns confidentially, meaning that the staff there will not contact the Office of Equal Opportunity without your consent. These are LoboRespect <http://loborespect.unm.edu> , the Womens' Resource Center <https://women.unm.edu> and the LGBTQ Resource Center <http://lgbtqrc.unm.edu> .

Econ 307 Economic Tools: Tentative Schedule for Week 1- Week 8

(Note: This schedule might change, as such check Learn for most up to date information)

| Week, Topic, and Required Prep | Sun* | Tue | Thu |
|--|--|---|-------------------------|
| <u>Week 1: Thinking like an Economist</u> Readings: <ul style="list-style-type: none"> • <i>How do Economists Study the Economy? (PDF)</i> • <i>Graphs in Economics (PDF)</i> • <i>Ingredients of a Mathematical Model (PDF)</i> • Jacques Ch. 1.2.2 Narrated Lectures: <ul style="list-style-type: none"> • The Economist's Toolbox • Thinking Like an Economist • Graphs in Economics • Ingredients of a Mathematical Model | 8/21 - | 8/23 Inventory Worksheets | 8/25 Start Lab 1 |
| <u>Week 2: Linear Equations</u> Readings: <ul style="list-style-type: none"> • Jacques Ch. 1.3-1.5 • <i>Solving Linear Equations by Substitution (PDF)</i> Narrated Lectures: <ul style="list-style-type: none"> • Linear Equations and Their Graphs • Creating Linear Equations from Graphs and Ordered Pairs • Solving for the Dependent Variable • Solving a System of Linear Equations • App. Supply and Demand Analysis | 8/28 PA.1 Q.1 PA.2 Q.2 | 8/30 Submit Lab 1 Start Lab 2 | 9/1 Submit Lab 2 |
| <u>Week 3: Nonlinear Equations</u> Readings: <ul style="list-style-type: none"> • Jacques Ch. 2.1-2.2 Narrated Lectures: <ul style="list-style-type: none"> • Intro to Nonlinear Equations • Quadratic Equations • App. Quadratic Supply & Demand Analysis • Exponential and Logarithmic Functions | 9/4 PA.3 Q.3 | 9/6 Start Lab 3 | 9/8 Submit Lab 3 |
| <u>Week 4: Single Variable Calculus I</u> Readings: <ul style="list-style-type: none"> • <i>Big Idea: Marginal Thinking (PDF)</i> • <i>Understanding Derivative as Slope (PDF)</i> • Jacques Ch. 4.1-4.2 Narrated Lectures: <ul style="list-style-type: none"> • What is a Function? • The Concept of a Derivative • Rules of Differentiation I • App. Marginal Analysis in Economics | 9/11 PA.4 Q.4 | 9/13 Exam 1 | 9/15 Start Lab 4 |

| Week, Topic, and Required Prep | Sun* | Tue | Thu |
|---|-------------------------|---|--------------------------|
| <u>Week 5: Single Variable Calculus II</u> Readings: • Jacques Ch. 4.4 Narrated Lectures: • Rules of Differentiation II | 9/18 PA.5 Q.5 | 9/20 Submit Lab 4 Start Lab 5 | 9/22 Submit Lab 5 |
| <u>Week 6: Single & Multivariable Calculus I</u> Readings: • Jacques Ch. 4.6-4.7; Ch. 5.1 Narrated Lectures: • Single Variable Optimization • Single Variable Optimization in Economics • Partial Differentiation | 9/25 PA.6 Q.6 | 9/27 Start Lab 6 | 9/29 Submit Lab 6 |
| <u>Week 7: Multivariable Calculus II</u> Readings: • Jacques Ch. 5.2 | 10/2 PA.7 Q.7 | 10/4 Start Lab 7 | 10/6 Submit Lab 7 |
| <u>Week 8: Exam</u> Study for Exam | 10/9 - | 10/11 Exam 2 | 10/13 Fall Break |

Notes:

- Sun*: All assignments on this day (Sunday) are due by 11:59pm that day and will be submitted via Learn.
- PA: Post Assessment
- Q: Pre-Lab Quiz