ECO 7408: Math Methods for Economics

INSTRUCTOR

Dr. Thomas Knight
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CLASS MEETINGS AND OFFICE HOURS

This is a face-to-face class. Your attendance a live lectures is expected. There are no remote attendance or participation options. We will meet each Monday and Wednesday, 9:35-11:30am, in Matherly Hall 103.

I will hold virtual office hours each Wednesday afternoon, 4:00-5:00pm. Please send me an email in advance if you plan to attend, if possible. The Zoom link for virtual office hours is: https://ufl.zoom.us/j/97080818226

REQUIRED AND SUGGESTED MATERIALS:

- Required: Bergin, Mathematics for Economists with Applications, Routledge (ISBN: 9780415638289)
- Required: Simon and Blume, Mathematics for Economics, Norton, 1994 (ISBN: 0393957330)
- Recommended: Schaum's Outline of Introduction to Mathematical Economics, 3rd Edition (McGraw-Hill) (ISBN: 9780071762519)

COURSE DESCRIPTION

This is a half-semester, introductory doctoral course in mathematical economics. We will begin with a quick and simple review of integration. We will then spend the majority of the course covering linear algebra topics, which will be applied to constrained optimization and regression analysis in subsequent courses in the Ph.D. in Economics curriculum. We will conclude with a brief overview of differential and difference equations.

It is assumed that you are comfortable with differentiation and have experience taking partial derivatives. If this is not the case, please speak to me before the end of the Drop/Add period.

CORE REQUIREMENTS

1. Continued enrollment in this course is equivalent to acceptance of all stated responsibilities, policies, and due dates. If there is anything that is unclear, talk to me *immediately*. Waiting until the end of the term often results in less favorable outcomes.
2. Students are expected to attend all meetings and participate actively. I encourage you to ask questions during these lectures to make the classroom environment as interactive and engaging as possible.
3. Students are expected to complete five analytic problem sets. These problem sets relate to the topics of the preceding lectures, are intended to offer you practice with the relevant solution techniques, and should help prepare you for the final exam.
4. There is a cumulative final exam that is required for successful completion of this course. This exam is a closed-book exam, and is to be taken individually. As the course progresses, I will explain the structure and composition of the exam.

COURSE COMMUNICATIONS

Announcements concerning the class will typically be made during class meetings and by email. You are responsible for all information made available through both of these avenues of communication. It is assumed that you are attending each lecture, and that you are regularly monitoring your UF email account (i.e., checking it daily).

I will not use the Canvas messaging feature, nor respond to these messages. I archive all email messages, and Canvas does not generate a usable record of our correspondence. Send all email correspondence to thomas.knight@ufl.edu.

COVID PRECAUTIONS

You are expected to wear a mask in all UF facilities, including our classroom, even if you are vaccinated. I will be wearing a mask during our classes to reduce the spread of COVID-19 and to protect my family, you, and myself.

COURSE GRADING POLICY

Grades are calculated and assigned according to a total point system. There are 100 possible points, and the breakdown is as follows:

1) Each of the 5 Problem Sets is worth 10 possible points.
2) The Final Exam is worth 50 possible points.

I will use this calculation to determine each student's within class standing and assign final grades based on that information.

PROBLEM SET GUIDELINES

There are five problem sets required for successful completion this course. These problem sets are designed to provide you with practice with the theories, models, and analytical tools covered in the course. My hope is that these problem sets will assist you in understanding of the technical content of this course, and in preparing for the final exam.

You should submit a PDF file into Canvas by the deadline. Your scanned submission should be high-quality and professionally presented. Your handwriting must be legible, and graphs must be accurate. Responses that are not clearly correct and presented professionally will not earn credit. Late submissions will not be accepted.

You may work in groups, but each student is responsible for turning in his or her own work, which must include his or her own individual mathematical derivations and written explanations.

PROBLEM SET SCHEDULE

Problem Set	Opening Date	Due Date
Problem Set 1	Monday, Aug. 23 @ 11:30am	Wednesday, Aug. 30 @ 9:30am
Problem Set 2	Wednesday, Aug. 30 @ 11:30am	Wednesday, Sept. 8 @ 9:30am
Problem Set 3	Wednesday, Sept. 8 @ 11:30am	Wednesday, Sept. 15 @ 9:30am
Problem Set 4	Wednesday, Sept. 15 @ 11:30am	Monday, Sept. 27 @ 9:30am
Problem Set 5	Monday, Sept. 27 @ 11:30am	Wednesday, Oct. 6 @ 9:30am

FINAL EXAM

The Final Exam will be administered during our final course class meeting at 9:35am on Wednesday, October 13. This is a closed book/closed note exam. All students must compete this exam synchronously (i.e., at the same time) to maintain academic integrity. If you are more than 10 minutes late, you will not be able to complete the exam.

Non-programmable, four-function and scientific calculators are allowed; no other calculators are permitted. You may not use a graphing calculator or any device with communications abilities. The use of cell phones, PDAs, or any other programmable device during an exam is not allowed, and violating this policy constitutes a violation of the University of Florida Student Honor Code.

ACADEMIC HONESTY

You may collaborate on the Problem Sets, but you should turn in your own submission that represents your own efforts and analyses. The final exam is taken individually, and collaboration is explicitly prohibited.

You are expected to abide by the University's rules for academic honesty. These rules are available for your review at https://sccr.dso.ufl.edu/process/honor-code/.

I take these rules very seriously and am committed to upholding the policies and integrity of the University of Florida and the Ph.D. in Economics program. Cheating, plagiarism, or any other behavior that violates these rules will be prosecuted to the fullest extent.

SPECIAL NEEDS AND GENERAL COMMENTS ON WELLNESS

If you are a student with special needs and you require additional resources to participate successfully in this course, please contact me during the first week of classes. The Disability Resource Center may provide reasonable accommodations to support your success. Once you obtain documentation from the DRC, please forward it to me, and accommodations can be arranged.

Graduate School is an exciting learning experience and a unique opportunity for personal growth. It can, however, also be a stressful and difficult transitionary period. If you are ever having general issues with your coursework *in any course* or trouble in your personal life, please seek help from myself or another faculty member. I also encourage you to utilize the *FREE* and *ANONYMOUS* services of the UF Counseling and Wellness Center.

NOTE ON END-OF-TERM COURSE EVALUATIONS

At the end of each term, you have the ability to evaluate the quality of each of your courses and the effectiveness of your instructors. I encourage you to take this opportunity seriously and to provide serious and informative feedback. Personally, I am always trying to improve my courses – tweaking them bit-by-bit each term – and student feedback is essential to making real improvements. As the term nears an end, I will discuss this opportunity in lecture, as I believe the high quality of your education depends on your constructive criticism and affirming support. You can access end-of-term course evaluations at:

https://ufl.bluera.com/ufl/

COURSE SCHEDULE

Monday, Aug. 23	Syllabus and Introduction to Integral Calculus Reading: Syllabus, Chapter 14 (B), Appendix 4 (SB) Problem Set 1 opens @ 11:30am
Wednesday, Aug. 25	Integral Calculus Chapter 14 (B), Appendix 4 (SB)
Monday, Aug. 30	Introduction to Linear Algebra Reading: Chapters 2 and 3 (B), Chapter 6 (SB) Problem Set 1 due @ 9:30am Problem Set 2 opens @ 11:30am
Wednesday, Sept. 1	Introduction to Linear Algebra Reading: Chapters 2 and 3 (B), Chapter 6 (SB)
Monday, Sept. 6	NO CLASS: LABOR DAY HOLIDAY
Wednesday, Sept. 8	Solving Linear Systems Reading: Chapters 2 and 3 (B), Chapter 7 (SB) Problem Set 2 due @ 9:30am Problem Set 3 opens @ 11:30am
Monday, Sept. 13	Matrix Algebra Reading: Chapters 2 and 3 (B), Chapter 8 (SB)
Wednesday, Sept. 15	The Determinant, Linear Dependence, and Cramer's Rule* Reading: Chapters 2 and 3 (B), Chapters 9 and 11 (SB) Problem Set 3 due @ 9:30am Problem Set 4 opens @ 11:30am
Monday, Sept. 20	The Determinant, Linear Dependence, and Cramer's Rule (continued) Reading: Chapters 2 and 3 (B), Chapters 9 and 11 (SB)
Wednesday, Sept. 22	Introduction to Eigen Values and Dynamics Reading: Chapter 15 (B), Chapter 23 (SB)
Monday, Sept. 27	Implicit Functions Reading: Chapter 7 (B), Chapter 15 (SB) Problem Set 4 due @ 9:30am Problem Set 5 opens @ 11:30am
Wednesday, Sept. 29	NO CLASS
Monday, Oct. 4	Introduction to Difference and Differential Equations Reading: Chapters 16 and 17 (B), Chapters 24 and 25 (SB)
Wednesday, Oct. 6	Introduction to Difference and Differential Equations Reading: Chapters 16 and 17 (B), Chapters 24 and 25 (SB) Problem Set 5 due @ 9:30am

Monday, Oct. 11	Exam Review
Wednesday, Oct. 13	Final Exam (@ 9:35am)