Course Syllabus

Course Information

ECO 4351.001 Mathematical Economics, Fall, 2015
Tuesday and Thursday, 4:00-5:15 PM
FO 1.502

Professor Contact Information

Instructor: *Dan O'Brien*
Office: *WSTC 2.212*
Office Hours: *Tuesday 3:00-3:45 PM or by appointment*
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Course Description

This course develops the basic mathematical tools required for the advanced study of economics. Its purpose is to introduce and practice the application of mathematical methods and concepts to prepare students for an in-depth study of econometrics, microeconomics and macroeconomics. Students should have a basic understanding of calculus, statistics, mathematical analysis, notation and proofs. Each student is expected to read and study the assigned material, participate in class discussion, and to complete in-class and homework assignments.

Student Learning Objectives/Outcomes

On completing this course, the student will be able to:

- Design and test mathematical models of microeconomic theories of the household, the firm and markets
- Analyze mathematical models of macroeconomic theories of consumption and investment
- Apply mathematical techniques of optimization and linear algebra

Required Textbooks and Materials

Fundamental Methods of Mathematical Economics, Fourth Edition by Alpha C. Chang and Kevin Wainwright ISBN: 0-07-010910-9

Assignments & Academic Calendar

8/23	Ch. 1-3 LM1	Math and Basic Economics Review
8/25-9/1	Ch. 4-5 LM2	Linear algebra
9/6-9/8	Ch. 6 LM3	Derivatives, limits, continuity, differentiability
9/13-9/15	Ch. 7 LM4	Differentiation and comparative statics
9/20-9/22	Ch. 8 LM5	Differentials, implicit functions, general comparative statics
9/27	Exam I	Chapters 1-8 LM 1-5
10/4-10/6	Ch. 9 LM6	Optimization, Taylor and MacLaurin series, optimality tests
10/11	Ch. 10 LM7	Exponential and logarithmic functions
10/13-10/18	Ch. 11 LM8	Optimization of multivariate functions, quadratic forms
10/20-10/25	Ch. 12 LM9	Optimization with equality constraints
10/27	Exam II	Chapters 9-12 LM 6-9
11/1-11/3	Ch. 13 LM10	Inequality constraints, NDCQ, Maximum-value functions, envelope theorems
11/8-11/10	Ch. 14 LM11	Integration
11/15-11/17	Ch. 15 LM12	First order differential equations
11/22-11/24	Ch. 16 LM13	Higher order linear differential equations, complex numbers, circular functions, complex roots
11/29	Ch. 19 LM16	Systems of differential equations (overview)
12/1	Ch. 20 LM17	Introduction to optimal control theory (overview)
12/6	Exam III	Chapters 14-16 LM11-13

Note: this schedule is subject to change based on progress made in class and on homework assignments.

Grading Policy

Letter grades will be assigned based on:

97-100% (or more)	=	A+
92-96%	=	A
90-91%	=	A-
88-89%	=	B+
82-87%	=	B
80-81%	=	B-
78-79%	=	C+
72-77%	=	C
70-71%	=	C-
68-69%	=	D+
62-67%	=	D
60-61%	=	D-
less than 60	=	F

Exams and homework will be weighted as follows:

Homework	25%
Examinations	25% for each exam

Course & Instructor Policies

Although attendance on lecture/discussion days is not required, class attendance is important for at least three reasons. We will have in-class exercises designed to reinforce techniques described in the text and in class. Also, student learning is invariably enhanced by interaction with other students, and by questions asked and discussed by students and the instructor. It is my experience that class attendance and test scores are highly correlated. If your final grade is near the top of a grade range, I will consider class attendance and participation when assigning your course grade.

Homework problems will be assigned regularly, usually weekly, and will constitute a substantial percentage (25%) of your grade in the course. You are encouraged to form groups to work on the homework. Each homework assignment will be due at the beginning of the class one week from the one in which it is assigned unless another date is specified in the assignment. The homework will be graded; we will review each assignment in class. The homework must be in your own handwriting or be your own original computer work.

Student Conduct and Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UT Dallas printed publication, *A to Z Guide*, which is available to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Series 50000*, Board of Regents, The University of Texas System, and in *Title V, Rules on Student Services and Activities* of the university's *Handbook of Operating Procedures*. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391) and online at http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairs-HOPV.html.

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

[Added July 2010] Students are expected to be attentive during class and to participate actively in group activities. Students are expected to listen respectfully to faculty and to other students who are speaking. Racism, sexism, homophobia, classism, ageism, and other forms of bigotry are inappropriate to express in class. Classes may discuss issues that require sensitivity and maturity. Disruptive students will be asked to leave and may be subject to disciplinary action.

Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic Dishonesty: Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, submitting for credit any work or materials that are attributable in whole or in part to another person, taking an examination for another person, or any act designed to give unfair advantage to a student or the attempt to commit such acts.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source, is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of *turnitin.com*, which searches the web for possible plagiarism and is over 90% effective.

Copyright Notice

The copyright law of the United States (*Title 17, United States Code*) governs the making of photocopies or other reproductions of copyrighted materials, including music and software. Copying, displaying, reproducing, or distributing copyrighted works may infringe upon the copyright owner's rights and such infringement is subject to appropriate disciplinary action as well as criminal penalties provided by federal law. Usage of such material is only appropriate when that usage constitutes "fair use" under the Copyright Act. As a UT Dallas student, you are required to follow the institution's copyright policy (UTDPP1043). For more information about the fair use exemption, see http://copyright.lib.utexas.edu/copypol2.html.

Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's UT Dallas email address and that faculty and staff consider email from students official only if it originates from a UT Dallas student account. This allows the university to maintain a high degree of confidence in the identity of all individuals corresponding and the security of the transmitted information. UT Dallas furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at UT Dallas provides a method for students to have their UT Dallas mail forwarded to other accounts.

Class Attendance

Regular and punctual class attendance is expected. Students who fail to attend class regularly are inviting scholastic difficulty. Absences may lower a student's grade where class attendance and class participation are deemed essential by the instructor. In some courses, instructors may have special attendance requirements; these should be made known to students during the first week of classes.

Withdrawal from Class

The administration of this institution has set deadlines for withdrawal from any college-level courses. These dates and times are published in that semester's course inventory and in the academic calendar. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, a professor or other instructor cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

Student Grievance Procedures

Procedures for student grievances are found in university policy UTDSP5005 (http://policy.utdallas.edu/utdsp5005). In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originated.

Incomplete Grade Policy

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of F.

Disability Services

It is the policy and practice of The University of Texas at Dallas to make reasonable accommodations for students with properly documented disabilities. However, written notification from the Office of Student AccessAbility (OSA) is required. If you are eligible to receive an accommodation and would like to request it for a course, please discuss it with an OSA staff member and allow at least one week's advanced notice. Students who have questions about receiving accommodations, or those who have, or think they may have, a disability (mobility, sensory, health, psychological, learning, etc.) are invited to contact the Office of Student AccessAbility for a confidential discussion.

The primary functions of the Office of Student AccessAbility are to provide:

1. academic accommodations for students with a documented permanent physical, mental or sensory disability
2. non-academic accommodations
3. resource and referral information and advocacy support as necessary and appropriate.

OSA is located in the Student Services Building, suite 3.200. They can be reached by phone at (972) 883-2098, or by email at disabilityservice@utdallas.edu.

Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, *Texas Code Annotated*.

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of *TEC 51.911(b)*, and the student and instructor will abide by the decision of the chief executive officer or designee.

Avoiding Plagiarism

[Adapted from Duke University's guidelines for writers; added July 2010]

Take time to make careful choices among--and learn to use--the research tools available to you. You will probably find that your favorite web search engine is not adequate by itself for college-level research. Consult with your professor or a librarian. You may need to use specialized research tools, some of which may require learning new searching techniques.

Expect to make trips to the library. While you can access many of the library's resources from your home computer, you may find that you need to make several trips to use materials or research tools that are not accessible remotely. Of course, you will be seeking the best information, not settling for sources simply because they happen to be available online.

Allow time for gathering materials that are not available at UT Dallas. The InterLibrary Loan Office can borrow articles and books from other libraries, but this process takes additional time.

Allow time for reading, rereading, absorbing information, taking notes, synthesizing, and revising your research strategy or conducting additional research as new questions arise.

Sloppy note-taking increases the risk that you will unintentionally plagiarize. Unless you have taken note carefully, it may be hard to tell whether you copied certain passages exactly, paraphrased them, or wrote them yourself. This is especially problematic when using electronic source materials, since they can so easily be copied and pasted into your own document.

Identify words that you copy directly from a source by placing quotation marks around them, typing them in a different color, or highlighting them. (Do this immediately as you are making your notes. Don't expect to remember days or weeks later what phrases you copied directly.) Make sure to indicate the exact beginning and end of the quoted passage. Copy the wording, punctuation and spelling exactly as it appears in the original.

Jot down the page number and author or title of the source each time you make a note, even if you are not quoting directly but are only paraphrasing.

Keep a working bibliography of your sources so that you can go back to them easily when it's time to double-check the accuracy of your notes. If you do this faithfully during the note-taking phase, you will have no trouble completing the "works cited" section of your paper later on.

Keep a research log. As you search databases and consult reference books, keep track of what search terms and databases you used and the call numbers and URLs of information sources. This will help if you need to refine your research strategy, locate a source a second time, or show your professor what works you consulted in the process of completing the project.

You must cite direct quotes.

You must cite paraphrases. Paraphrasing is rewriting a passage or block of text in your own words. If you paraphrase, you must still cite the original source of the idea.

You must cite ideas given to you in a conversation, in correspondence, or over email.

You must cite sayings or quotations that are not familiar, or facts that are not "common knowledge." However, it is not necessary to cite a source if you are repeating a well known quote or familiar proverb. Common knowledge is something that is widely known. For example, it is widely known that Bill Clinton served two terms as president; it would not be necessary to cite a source for this fact.

These types of sources should be cited as well. *Printed sources*: Books, parts of books, magazine or journal articles, newspaper articles, letters, diaries, public or private documents; *Electronic sources*: Web pages, articles from e-journals, newsgroup postings, graphics, email messages, software, databases; *Images*: Works of art, illustrations, cartoons, tables, charts, graphs; *Recorded or spoken material*: Course lectures, films, videos, TV or radio broadcasts, interviews, public speeches, conversations.