

Course Syllabus

Course Information

ECO 4351.001 Mathematical Economics, Spring, 2020
Tuesday and Thursday, 4:00-5:15
GR3.606

PLEASE NOTE CHANGES TO THE SYLLABUS DUE TO THE ONLINE LEARNING ENVIRONMENT FOR THE REMAINDER OF THE SEMESTER (IN BOLD BELOW).

SUMMARY OF CHANGES:

THERE WILL NOT BE A SECOND MIDTERM EXAM SO THE GRADING POLICY HAS BEEN UPDATED.

WE HAVE MISSED ONE WEEK OF INSTRUCTION SO THE COURSE SCHEDULE HAS BEEN UPDATED.

HOMEWORK ASSIGNMENTS WILL NOW BE SUBMITTED ELECTRONICALLY. THE THIRD MIDTERM EXAM WILL BE A TAKE HOME EXAM. THE EXAM WILL BE AVAILABLE ON APRIL 28 AND ANSWERS WILL BE DUE BY THE END OF THE DAY ON APRIL 30.

ADDITIONAL VOICE OVER POWERPOINT PRESENTATIONS ARE BEING ADDED TO ELEARNING FOR:

**EACH LEARNING MODULE POWERPOINT PRESENTATION
ANSWERS TO EACH SELF TEST
ANSWERS TO EACH HOMEWORK ASSIGNMENT**

EACH REGULARLY SCHEDULED CLASS WILL CONSIST OF A MICROSOFT TEAMS MEETING TO WHICH YOU WILL BE INVITED. THESE WILL BE OPPORTUNITIES TO UPDATE STATUS, IDENTIFY AND ADDRESS ISSUES, AND ANSWER YOUR QUESTIONS ABOUT THE COURSE MATERIAL.

Professor Contact Information

Instructor: *Dan O'Brien*
Office: *GR 2.820*
Office Hours: *Tuesday 1:00-3:30 PM or by appointment*
Phone: *972-883-2554*
Email: obri@utdallas.edu

Teaching Assistant Contact Information

TA: *Ji Li*
Office: *GR 3.416*
Office Hours: *Wednesday 3:00-5:00 PM*
Email: jxl190007@utdallas.edu

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
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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

1/14	Ch. 1-3 LM1	Math and Basic Economics Review
1/16-1/23	Ch. 4-5 LM2	Linear algebra
1/28-1/30	Ch. 6 LM3	Derivatives, limits, continuity, differentiability
2/4-2/6	Ch. 7 LM4	Differentiation and comparative statics
2/11-2/18	Ch. 8 LM5	Differentials, implicit functions, general comparative statics
2/20	Exam I	Chapters 1-8 LM 1-5
2/25-2/27	Ch. 9 LM6	Optimization, Taylor and MacLaurin series, optimality tests
3/3	Ch. 10 LM7	Exponential and logarithmic functions
3/5-3/10	Ch. 11 LM8	Optimization of multivariate functions, quadratic forms
3/31	Ch. 11 LM8	CONCAVITY AND CONVEXITY LM 8 SLIDES 28-35 SELF TEST LM8.7 HOMEWORK 8 ASSIGNED

- 4/2 **Ch. 12 LM9 Optimization with Equality Constraints**
 LM 9 SLIDES 1-11
 SELF TEST LM9.1 LAGRANGE
 SELF TEST LM9.2 2 CONSTRAINT LAGRANGE
- 4/7 **HOMEWORK 8 DUE**
Ch. 12 LM9 Bordered Hessian, Quasi-concavity
 LM9 SLIDES 12-30
 SELF TEST LM9.3 BORDERED HESSIAN
 SELF TEST LM9.4 QUASI CONCAVITY TEST
- 4/9 **Ch. 12 LM9 Homogeneous and Homothetic Functions**
 LM9 SLIDES 31-41
 SELF TEST LM9.4 HOMOGENEOUS FUNCTIONS
 SELF TEST LM9.5 HOMOTHETIC FUNCTIONS
 HOMEWORK 9 ASSIGNED
- 4/14 **Ch. 13 LM10 Optimization with Inequality Constraints**
 LM10 SLIDES 1-9
 SELF TEST 10.1 KUHN TUCKER
 SELF TEST 10.2 KUHN TUCKER 2
- 4/16 **HOMEWORK 9 DUE**
Ch. 13 LM10 Maximum Value Functions
 LM10 SLIDES 10-16
 SELF TEST 10.3 SHEPARD'S LEMMA
 SELF TEST 10.4 MEANING OF THE MULTIPLIER
 SELF TEST 10.5 DUALITY
 HOMEWORK 10 ASSIGNED
- 4/21 **Ch. 14 LM11 Integration**
 LM11 SLIDES 1-8
 SELF TEST LM11.1 BASIC INTEGRATION
 SELF TEST LM11.2 INT. BY SUBSTITUTION
- 4/23 **HOMEWORK 10 DUE**
Ch. 15 LM11 Integration (continued)
 LM11 SLIDES 9-17
 SELF TEST LM12.3 INT. BY PARTS
 SELF TEST M12.4 DOUBLE INTEGRAL
 THERE IS NO HOMEWORK 11
- 4/28 **MIDTERM 3 REVIEW SESSION ON TEAMS**
MIDTERM 3 AVAILABLE ON ELEARNING AT END OF CLASS PERIOD
- 4/30 **MIDTERM 3 ANSWERS DUE**

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

**NOTE: STUDENTS WILL BE GIVEN FULL CREDIT FOR MIDTERM 2
FINAL COURSE GRADE CALCULATION:**

(MID 1 GRADE/100)*25

+25 (MID 2)

+25 (HWK)

+EXTRA CREDIT

+/-HOMEWORK GRADES

+(MID 3 GRADE/100)*25

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 class period 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.

NOTE:

FOR THE REMAINDER OF THE SEMESTER HOMEWORK AND MIDTERM 3

ANSWERS MUST BE SUBMITTED ELECTRONICALLY. IF POSSIBLE PLEASE SCAN

***YOUR HOMEWORK ANSWERS AND SUBMIT THEM BY EMAIL JI LI
(jxl190007@utdallas.edu). SUBMIT MIDTERM 3 ANSWERS TO DR. O'BRIEN BY
EMAIL.***

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

“As a Comet, I pledge honesty, integrity, and service in all that I do.”

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University’s policies and procedures segment of the course syllabus.

Please go to <http://go.utdallas.edu/syllabus-policies> for these policies.