

ECON 409 Mathematical Economics

Spring 2001, TTH 2:00 - 3:15 in Rouss 1102

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office hours: TTH 9:45 - 10:45 in Rouss 119, and by appointment

Required Text: *Fundamental Methods of Mathematical Economics*, Alpha Chiang, McGraw Hill, 3rd ed.

This is a class designed to introduce you to the basic mathematical techniques used by professional economists and other quantitative social scientists: equations, derivatives, comparative statics analysis of equilibrium models, optimization, constrained optimization, integration and dynamic models, difference and differential equation models, and inequality constraints in linear and nonlinear optimization problems. The basic prerequisite is about two semesters of calculus, and in particular, I will assume that you already know how to differentiate simple expressions. (If you're rusty, you may have to review Chapters 6 and 7 at the beginning of the semester, sooner than they appear on the syllabus). The purpose of the course is to prepare students for graduate work in economics and in the more quantitative MBA programs.

There will be homework assignments due on Thursdays, with a grading policy to be announced. You can miss any 3 assignments, but late papers (after the beginning of class) will not be accepted. There will be two tests and an exam. Grades: homework (20%), tests (20% each) and exam (40%).

Assignments

Jan 23 -25 Equilibrium Models: Chiang Chapters 1-3

Homework 1 due Jan 25: 2.3 problem 4; 2.4 problems 4, 6; 2.5 problems 4,6; 3.2 problem 2; 3.3 problems 2, 3a; 3.5 problem 2.

Jan 30-Feb.1 Matrix Algebra: Chapters 4-5

Homework 2 due Feb 1: 4.2 problem 2a,b, 6a; 4.3 problems 4a,b, 4.4 problem 2; 4.5 problem 4; 4.6 problem 2b; 5.1 problem 4; 5.2 problem 4a; 5.3 problem 4a, 6a; 5.4 problem 2a, 4a; 5.5 problem 2a,

Feb 6-8 Derivatives: Chapters 6-7

Homework 3 due Feb 8: 6.2 problem 2; 6.4 problem 2; 6.6 problem 2; 6.7 problem 4; 7.1 problem 2; 7.2 problems 2, 8a,c; 7.3 problem 4; 7.4 problem 2a,c; 7.5 problem 2; 7.6 problem 2.

Feb 13-15 Differentiation and Comparative Statics: Chapter 8

Homework 4 due Feb 15: 8.1 problem 4; 8.2 problems 2a, 4; 8.3 problem 2a; 8.4 problems 3, 4a; 8.5 problem 2; 8.6 problems 4, 6.

Feb. 20 review

Feb. 22 no class

Feb. 27 FIRST TEST on chapters 1-8

Mar. 1 begin discussio of Chapter 9

Mar. 6-8 Optimization: Chapter 9, and skim chapter 10 up to p. 295

Homework 5: Mar. 8

9.2: 2(a) and 4(a,b)

9.3: 4

9.4: 2 and 6

9.5: 2(a) and 3(a)

9.6: 2(a)

10.1: 3(a)

10.5: 1(a) and 1(b)

Mar. 13-15 Break

Mar. 20-22 Exponential and Logarithmic Functions: Chapter 10

Homework 6: Mar 22

10.1: 4

10.2: 4c

10.3: 2(a), 2(b), 4(a), and 4(d)

10.4: 3, 4(a) and 4(b)

10.5: 6

10.6: 3(a) and 3(b)

10.7: 4 and 10

Mar. 27-29 Multivariate Optimization: Chapter 11

Homework 7: Mar 29

11.2: 2 and 4

11.3: 2 and 4(a) and 6(a - remember to answer the question that follows)

11.4: 2 and 6 as it pertains to the function in 2

11.5: 2(a), 6(b)

11.6: 2(a and b), and 4

Apr. 3 Chapter 12 (initial discussion)

Apr. 5 Second Test on chapters 9-11

Apr. 7-10 Constrained Optimization: Chapter 12 and 21.1 and 21.2

Homework 8: Apr. 10

12.2: 1(a) and 2(a) and 6

12.3: 1(a)

12.4: 1(all parts) and 2(c) and 4(a) and 8(a)

12.5: 2(a, b, c)

12.6: 4(a, b) and 6(a, b, c)

12.7: 4 and 8(a, b)

21.1: 2

21.2: 6

Apr. 17 - 19 Dynamics and Integration: Chapter 13

Homework 9: Apr. 19 (or in my mailbox in Rouss 114 by 4pm on Friday the 20)

13.2 2(b), 2(c)

13.3 2(b) 2(d)

13.4 2 (a) 2(c), 3(a), 3(c)

13.5 2, 4

Apr. 24 Differential Equations: Chapters 14

Homework 10 due **Tuesday** Apr. 24 no class Apr. 26

you can check with answers in the back for most problems.

14.1 1(a) 1(c), 3(a) 3(c)

14.2 4

14.3 1, 3, 5

14.4 1(a)

14.5 1(a) 1(b) 1(c), 2(a) 2(b)

14.6 1(a) 1(c)

Final Exam: note date posted on University Web Page, 9-12 am