

ECONOMICS 500
QUANTITATIVE METHODS IN ECONOMIC ANALYSIS I
FALL 2004
MTWRF 11-11:55, F 1:10-2:00 – 160 HEADY

Arne Hallam - Instructor

1. OBJECTIVES

The main objective of this course is for the student to be able to comfortably work standard problems in beginning graduate level micro and macroeconomic theory using tools from single and multi-variable calculus, elementary matrix algebra, and classical non-linear programming. Upon completion of the course students will be able to set up and analytically solve constrained and unconstrained non-linear optimization problems. The student will be able to address first and second order optimality conditions for such problems and use techniques from linear algebra to solve implied systems of equations. The student will also be able to perform comparative statics exercises on equilibrium or first order conditions arising from economic problems. The student will also demonstrate competence in using a mathematical analysis package (Mathematica) to solve economic problems.

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Office Hours:
MW 15:00-16:00 266B Heady
TR 14:00-15:30 266B Heady
R 9:30-11:00 266B Heady

Office Hours:
MW 10:11:00 83 Heady Hall
F 12:00-13:00 83 Heady Hall

2. TEXTS

Hoy, M., J. Livernois, C. McKenna, R. Rees, Thanasis Stengos. *Mathematics for Economists*, 2nd edition, Cambridge, MA: MIT Press, 2001.

Huang, Cliff J. and Philip S. Crooke. *Mathematics and Mathematica for Economists*. Malden: Blackwell Publishers, 1997.

Wackerly, D.D., William Mendenhall III, Richard L. Scheaffer. *Mathematical Statistics with Applications*, 6th edition, Pacific Grove, CA: Duxbury, 2002.

3. WORLD WIDE WEB RESOURCES

The homepage for the course is at <http://www.econ.iastate.edu/classes/econ500/hallam>. The page contains a copy of this syllabus, problem sets, and other material.

Date: August 21, 2004.

4. EVALUATION

Students will be evaluated based on their ability to analyze problems in mathematics and mathematical economics. Students will demonstrate competence in a variety of ways including examinations, problem sets and in-class exercises. The following evaluation instruments will be used.

Class examinations - There will be four in-class examinations. These examinations will be on 3 September, 17 September, 1 October and 15 October. The final exam for the course (over the statistics part only) will be on 16 December at 9:45 a.m. 400 points

Problem sets - There will be eight problem sets during the first section. They will be worth 25 points each. Problem sets will be collected at the beginning of class on the due date. Late problem sets will not be accepted unless you have informed me prior to the due date that you will be unable to meet the deadline due to circumstances beyond your control. You may hand the problem sets in early. 200 points

In-class exercises - There will be 12 in-class exercises each worth 10 points. The ten best scores will count towards your grade. Some will be done in a group setting. There will be no make-up for any of these exercises. If you miss an exercise, you will receive a zero for that exercise. 100 points

Total possible 700 points

Economics 500 - Fall 2004 Course Schedule

Month	Date	Day	Lec	Lecture Topic	Reading
Aug	25	M	1	Convexity and Optimization	H 498-512, H&C 345-391
Aug	23	T	2	Multivariate Calculus	H 455-476, H&C 261-278
Aug	24	W	3	Multivariate Calculus	H 455-476, H&C 261-278
Aug	26	R	4	Multivariate Optimization	H 545-559, H&C 392-411
Aug	27	F	5	Multivariate Optimization	H 545-559, H&C 392-411
Aug	30	M	6	Multivariate Optimization	H 560-568, H&C 392-411
Aug	31	T	7	Multivariate Optimization	H 560-568, H&C 392-411
Sep	1	W	8	Simple Constrained Optimization	H 585-615, H&C 415-426
Sep	2	R	9	Simple Constrained Optimization	H 585-615, H&C 415-426
Sep	3	F		Simple Constrained Optimization	
Sep	7	T	10	Exam I	H 616-621, H&C 415-426
Sep	8	W	11	Matrix Equations	H 279-313, 405-420, H&C 113-131
Sep	9	R	12	Geometry of Matrices	H 279-313, 405-420, H&C 90-112
Sep	10	F	13	Geometry of Matrices	H&C 90-112
Sep	13	M	14	Geometry of Matrices	H&C 90-112
Sep	14	T		No Class	H&C 90-112
Sep	15	W	15	Quadratic Forms and Definite Matrices	H 436-449, H&C 231-260
Sep	16	R	16	Quadratic Forms and Definite Matrices	H 436-449, H&C 231-260
Sep	17	F		Exam II	
Sep	20	M	17	General Constrained Optimization	H 622-630, H&C 319-344
Sep	21	T	18	General Constrained Optimization	H 622-630, H&C 319-344
Sep	22	W	19	General Constrained Optimization	H 622-630, H&C 427-441
Sep	23	R	20	General Constrained Optimization	H 622-630, H&C 427-441
Sep	24	F	21	Comparative Statics	H 631-642, H&C 279-289
Sep	27	M	22	Comparative Statics	H 631-642, H&C 290-301
Sep	28	T		No Class	
Sep	29	W	23	Comparative Statics	H 643-659, H&C 302-308
Sep	30	R	24	Comparative Statics	H 643-659, H&C 309-318
Oct	1	F		Exam III	
Oct	4	M	25	Open Topic	
Oct	5	T	26	General Optimization Problems	H 677-685, H&C 442-487
Oct	6	W	27	General Optimization Problems	H 677-685, H&C 442-487
Oct	7	R	29	General Optimization Problems	H 686-695, H&C 442-487
Oct	8	F	29	General Optimization Problems	H 686-695, H&C 442-487
Oct	11	M	30	Economics and Optimality	H 660-673
Oct	12	T		No Class	
Oct	13	W	31	Economics and Optimality	H 660-673
Oct	14	R	32	Economics and Optimality	H 660-673
Oct	15	F		Exam IV	
Dec	16	R		Final Exam – 9:45-11:45	