ECONOMICS 207
QUANTITATIVE METHODS IN ECONOMIC ANALYSIS I
SPRING 2008
MW 11:00-11:50
BESSEY 210

Arne Hallam - Instructor

1. OBJECTIVES

The objective of this course is for students to be able to comfortably use standard tools in college algebra, introductory linear algebra and introductory calculus in beginning and intermediate level micro and macroeconomic theory. Upon completion of the course students will be able to perform the following tasks:

(i) identify the objective, the decision variables and the constraints in economic decision problems,
(ii) represent elements of economic problems in simple mathematical models,
(iii) identify and apply mathematical tools that can be used to solve various economic problems,
(iv) understand the strengths and limitations of alternative solution methods,
(v) interpret the economic meaning and implications of solutions to mathematical models.

Stated in an alternative fashion, the student will be able to parameterize various economic relationships in terms of functions, equations, and systems of equations. The student will be able to analyze the properties of these functions and solutions to these equations. The student will be able to set up and analytically solve constrained and unconstrained non-linear optimization problems that arise in economic theory. The student will be able to address first and second order optimality conditions for such problems and use techniques from linear algebra to solve linear 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 course will consist of weekly lectures briefly reviewing mathematical concepts used in beginning and intermediate level economics followed by analysis of problems utilizing these concepts. The majority of learning in the course will take place through the working of numerous problems in mathematical economics during laboratory sessions and through extensive homework. Students will typically spend six to eight hours per week outside of lectures working problems alone and in groups.

2. TEXT

Sydsaeter, Knut and Peter Hammond. *Essential Mathematics for Economic Analysis*, Harlow, England: Pearson Education Limited, 2nd edition, 2006.

3. MEETING TIMES AND PLACES

Lecture	MW 11:00-11:50	Bessey 210	Arne Hallam or Sonali Roy
Lab 1	M 14:10-16:00	Heady 162	Sonali Roy, Helen Yang, Thomas Kaiser, Ashley Seaton, Rick Stammer
Lab 2	T 13:10-15:00	Curtiss 307	Sonali Roy, Luc Veyssiere, Eric Wilson, Michelle Euken
Lab 3	W 15:10-17:00	East 211	Sonali Roy, Helen Yang, Matt Stinn, Kandice Harper

4. WORLD WIDE WEB RESOURCES

The home page for the course is at http://www.econ.iastate.edu/classes/econ207/hallam. The page contains a copy of this syllabus, problem sets, and other material.

Date: March 4, 2008.

Instructors

Instructor:	**Office Hours:**	**Location**
Arne Hallam	MW 9:30-10:45	266B Heady
266B Heady Hall	W 13:15-15:00	266B Heady
Work: 294–5861 Home: 292–8739		
ahallam@iastate.edu		

Teaching Assistant 1:	**Office Hours:**	**Location**
Sonali Roy	M 12:15-14	178 Heady
280A Heady Hall	T 10:45-12:45	178 Heady
294–6989	10:45-13:00	280A Heady
sroy@iastate.edu		

Teaching Assistant 2:	**Office Hours:**	**Location**
Luc Veyssiere	W 17:00-18:00	180B Heady
180B Heady Hall	F 8:00-10:00 and 15:00-18:00	180B Heady
294–5895		
luc@iastate.edu		

Teaching Assistant 3:	**Office Hours:**	**Location**
Helen Yang	M 12-13	178 Heady
78 Heady Hall	TR 11-13	78 Heady
294–1082	W 12-13, 14-15	178 Heady
pseudo@iastate.edu	R 13-14	178 Heady
	TR 15:30-16:30	178 Heady

5. Evaluation

Students will be evaluated based on their ability to analyze problems in beginning and intermediate level microeconomics and macroeconomics using the tools of college algebra, introductory linear algebra and calculus. 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 five in-class 100 point examinations. These examinations will be on 4 February, 25 February, 12 March, 7 April and 23 April. The final exam for the course will be on Wednesday 7 May from 9:45-11:45 and will be worth 200 points. — 700 points

In-class laboratory exercises - There will be twelve to fifteen in-lab exercises. They will be worth 25 points each. The twelve highest scores will count towards your grade. Exercises will be collected at the end of each lab period. — 300 points

Take-home problem sets - There will be twelve to fifteen take-home problem sets. They will be worth 25 points each. The twelve highest scores will count towards your grade. 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. — 300 points

Total possible — 1300 points

Economics 207 - Spring 2008 Course Schedule

Month	Date	Day	Lec	Lecture Topic	Reading
Jan	14	M	1	Algebra	S&H 1-36
Jan	16	W	2	Functions	S&H 37-54
Jan	23	W	3	Functions and Equations	S&H 83-133
Jan	28	M	4	Systems of Equations	S&H 549-552
Jan	30	W	5	Systems of Equations	S&H 549-552
Feb	4	M		**Exam I**	
Feb	6	W	6	Univariate Differential Calculus	S&H 163-266
Feb	11	M	7	Univariate Differential Calculus	S&H 163-266
Feb	13	W	8	Univariate Integral Calculus	S&H 305-347
Feb	18	M	9	Simple Univariate Optimization	S&H 269-304
Feb	20	W	10	Simple Univariate Optimization	S&H 269-304
Feb	25	M		**Exam II**	
Feb	27	W	11	Introduction to Matrix Algebra	S&H 549-569
Mar	3	M	12	Introduction to Matrix Algebra	S&H 568-587
Mar	5	W	13	Matrix Algebra and Systems of Equations	S&H 576-590
Mar	10	M	14	Matrix Algebra and Systems of Equations	S&H 591-606
Mar	12	W		**Exam III**	
Mar	17–21	M-F		**Spring Break**	
Mar	24	M	15	Matrix Algebra and Systems of Equations	S&H 607-618
Mar	26	W	16	Matrix Algebra and Systems of Equations	S&H 619–622
Mar	31	M	17	Multivariate Calculus	S&H 377-412
Apr	2	W	18	Multivariate Calculus	S&H 377-412
Apr	7	M		**Exam IV**	
Apr	9	W	19	Convexity and Optimization—Multivariate Optimization	S&H 463-471
Apr	14	M	20	Multivariate Optimization	S&H 472-485
Apr	16	W	21	Multivariate Optimization	S&H 486-502
Apr	21	M	22	General Constrained Optimization	S&H 503-511
Apr	23	W		**Exam V**	
Apr	28	M	23	General Constrained Optimization	S&H 503-511
Apr	30	W	24	General Constrained Optimization	S&H 512-519
May	7	W		**Final Exam – 9:45-11:45**	