Course Syllabus

Course Information	Instructor Information
Economics 511	Daniel Primont
Advanced Mathematical Economics	primo@siu.edu, 453-5066
Spring 2009	http://mypage.siu.edu/primo/
Faner 4135	Office Hours, Faner 4145
TTh 11:00 a.m.-12:15 p.m.	TTh 9:00-10:50 a.m., 3:15-4:15 p.m.

Teaching Assistant: Wei Gao, Faner 4042, weigao@siu.edu
Office Hours: Wed. 10:00 a.m. - 12:00 p.m.

Textbook: *Mathematics for Economists*, Michael Hoy, John Livernois, Chris McKenna, Ray Rees, and Thanasis Stengos, Cambridge: The MIT Press, Second Edition, 2001.

Student Solutions Manual for Mathematics for Economists, Michael Hoy, John Livernois, Chris McKenna, Ray Rees, and Thanasis Stengos, Cambridge: The MIT Press, Second Edition, Paper, December 2001.

Grading: There will be twelve quizzes given on Thursdays at 11:00 a.m. The best ten quiz grades out of twelve will count towards the course grade. Quiz 1 will be given on January 22 and will be based on the material covered in class since January 13. Each subsequent quiz will be based on the material covered in class since the previous quiz. There will also be three examinations On the following pages there is a schedule of assigned readings. The final course grade is determined using the following weights.

	Date	Chapters	Weight
Quizzes (Best Ten)	See schedule		25%
Exam 1	Thursday, February 12	Chs. 14,15	25%
Exam 2	Thursday, March 26	Chs. 16-21	25%
Exam 3	Tuesday, May 5	Chs. 22-25	25%
Total			100%

Topic coverage is approximate.

Week	Dates	Chapter	Topics	
1	Jan 13		Introduction	
	Jan 15	14	Comparative Statics x = endogenous variable α = exogenous variable find $\frac{dx}{d\alpha}$ 631-641	
2	Jan 20	14	Implicit Function Theorem $f(x,\alpha) \equiv 0 \Rightarrow \frac{dx}{d\alpha} = -\frac{f_\alpha}{f_x}$ 643-658	
	Jan 22	14	Implicit Function Theorem	Quiz 1
3	Jan. 27	14	The Envelope Theorem $\frac{d}{d\alpha} f(x(\alpha),\alpha)$ 660-672	
	Jan 29	15	The Envelope Theorem	Quiz 2
4	Feb 3	15	Concave Programming $\max f(\mathbf{x})$ st $\mathbf{g}(\mathbf{x}) \geq 0, \mathbf{x} \geq 0$ 677-684	
	Feb 5	15	Kuhn-Tucker Conditions $\mathcal{L} = f(\mathbf{x}) + \sum_j \lambda_j g^j(\mathbf{x})$ $\mathcal{L}_i \leq 0, x_i \geq 0, x_i \mathcal{L}_i = 0$ $\mathcal{L}_j \geq 0, \lambda_j \geq 0, \lambda_j \mathcal{L}_j = 0$ 686-689	Quiz 3
5	Feb 10	15	Kuhn-Tucker Conditions	
	Feb 12	14, 15	**Exam 1**	

Week	Dates	Chapter	Topics/Pages	Quiz
6	Feb 17	17	Economic Dynamics $y_t, y_{t+1}, y_{t+2}, ... \dot{y} = \frac{dy}{dt}$ 753-761	
	Feb 19	18	LFOA Difference Eqns $y_{t+1} = ay_t + b$ 763-778	Quiz 4
7	Feb 24	19	NLFOA Difference Eqns $y_{t+1} = g(y_t)$ 789-798	
	Feb 26	20	LSOA Difference Eqns $y_{t+2} + a_1 y_{t+1} + a_2 y_t = b$	Quiz 5
8	Mar 3	16	Indefinite Integrals $\int f(x)\, dx$ Definite Integrals $\int_a^b f(x)\, dx$ Properties of Integrals 701-732	
	Mar 5	16	Improper Integrals $\int_0^\infty f(x)\, dx$ Techniques of Integration 733-747	Quiz 6
	Mar 10, 12		Spring Break	
9	Mar 17	21	LFOA Differential Eqns $\dot{y} + ay = b$ 849-870	
	Mar 19	21	LFO Differential Eqns $\dot{y} + a(t)y = b(t)$ 870-875	Quiz 7
10	Mar 24	16-21	Catch Up/Review	
	Mar 26	16-21	**Exam 2**	

Week	Dates	Chapter	Topic/Pages	
11	Mar 31	22	NLFO Differential Eqns $\dot{y} = g(y)$ $\dot{y} + a(t)y = b(t)y^n$ $A(t)\ dt + B(y)\ dy = 0$ 879-893	
	Apr 2	23	LSOA Differential Eqns $\ddot{y} + a_1\dot{y} + a_2 y = b$ 897-918	Quiz 8
12	Apr 7	23	LSOA Differential Eqns Cont.	
	Apr 9	24	Systems $\dot{y} = Ay + b$ 929-950	Quiz 9
13	Apr 14	24	Systems 951-974	
	Apr 16	25	Optimal Control Theory The Maximum Principle $\max J = \int_0^T f\left[x(t), y(t), t\right]\ dt$ s.t. $\dot{x} = g\left[x(t), y(t), t\right]$ $x(0) = x_0 > 0$ (given) 999-1012	Quiz 10
14	Apr 21	25	Current-Valued Hamiltonian Other Boundary Conditions	
	Apr 23	25	$x(T) = b, \quad x(T) \geq b$ 1014-1038	Quiz 11
15	Apr 28	25	Infinite Horizon $T \to \infty$ 1040-1053	
	Apr 30	22-25	Catch Up/Review	Quiz 12
Finals		22-25	**Exam 3**, Tuesday, May 5, 12:50 - 2:50 p.m.	

As the instructor for this course, I am required by the administration to include the following paragraphs.

Emergency Procedures:

Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on BERT's website at www.bert.siu.edu, Department of Safety's website www.dps.siu.edu (disaster drop down), and in Emergency Response Guideline pamphlet. Know how to respond to each type of emergency.

Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.