

Course Syllabus

Course Information

Economics 511
Advanced Mathematical Economics
Spring 2010
Faner 4135
TTh 11:15 a.m.-12:30 p.m.

Instructor Information

Daniel Primont
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<http://mypage.siu.edu/prim/>
Office Hours, Faner 4145
TTh 9:30-11:15 a.m., 3:15-4:30 p.m.

Teaching Assistant: Sabri Yilmaz (sabri@siu.edu)

Office Hours: MW 12:30 - 1:30 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 five quizzes given on Thursdays at 11:00 a.m. on the dates given below. Quiz 1 will be given on January 28 and will be based on the material covered in class since January 19. Each subsequent quiz will be based on the material covered in class since the previous quiz. There will also be two examinations during the term and a final exam during finals week. On the following pages there is a schedule of assigned readings. The final course grade is determined using the following weights.

	<u>Date</u>	<u>Chapters</u>	<u>Weight</u>
Quizzes	See schedule		30%
Exam 1	Tuesday, February 23	Chs. 14,15	20%
Exam 2	Thursday, April 1	Chs. 16, 21, 22	20%
Final Exam	Monday, May 10	Chs. 14-16. 21-25	<u>30%</u>
Total			100%

Topic coverage is approximate.

Week	Dates	Chapter	Topics
1	Jan 19		Introduction
	Jan 21	14	Comparative Statics $x =$ endogenous variable $\alpha =$ exogenous variable find $\frac{dx}{d\alpha}$ 631-641
2	Jan 26	14	Implicit Function Theorem $f(x, \alpha) \equiv 0 \Rightarrow \frac{dx}{d\alpha} = -\frac{f_\alpha}{f_x}$ 643-658
	Jan 28	14	Implicit Function Theorem Quiz 1
3	Feb 2	14	The Envelope Theorem $\frac{d}{d\alpha} f(x(\alpha), \alpha)$ 660-672
	Feb 4	14	The Envelope Theorem
4	Feb 9	15	Concave Programming $\max f(\mathbf{x})$ st $\mathbf{g}(\mathbf{x}) \geq 0, \mathbf{x} \geq 0$ 677-684
	Feb 11	15	Kuhn-Tucker Conditions Quiz 2 $\mathcal{L} = f(\mathbf{x}) + \sum_j \lambda_j g^j(\mathbf{x})$ $\mathcal{L}_i \leq 0, x_i \geq 0, x_i \mathcal{L}_i = 0$ $\mathcal{L}_j \geq 0, \lambda_j \geq 0, \lambda_j \mathcal{L}_j = 0$ 686-689
5	Feb 16	15	Kuhn-Tucker Conditions
	Feb 18	15	Catch Up/Review

Week	Dates	Chapter	Topics/Pages	Quiz
6	Feb 23		Exam 1	
	Feb 25		Free Day	
7	Mar 2, 4	16	Indefinite Integrals $\int f(x) dx$ Definite Integrals $\int_a^b f(x) dx$ Properties of Integrals 701-732	
	Mar 9, 11		Spring Break	
8	Mar 16	16	Improper Integrals $\int_0^\infty f(x) dx$ Techniques of Integration 733-747	
	Mar 18	21	LFOA Differential Eqns $\dot{y} + ay = b$ 849-870	Quiz 3
9	Mar 23	21	LFO Differential Eqns $\dot{y} + a(t)y = b(t)$ 870-875	
	Mar 25	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	
10	Mar 30		Catch Up/Review	
	Apr 1		Exam 2	

Week	Dates	Chapter	Topic/Pages
11	Apr 6, 8	23	LSOA Differential Eqns $\ddot{y} + a_1\dot{y} + a_2y = b$ 897-918
12	Apr 13	24	Systems $\dot{y} = Ay + b$ 929-950
	Apr 15		Systems Quiz 4
13	Apr 20	24	Systems
	Apr 22	25	Optimal Control Theory The Maximum Principle $\max J = \int_0^T f[x(t), y(t), t] dt$ s.t. $\dot{x} = g[x(t), y(t), t]$ $x(0) = x_0 > 0$ (given) 999-1012
14	Apr 27	25	Current-Valued Hamiltonian Other Boundary Conditions
	Apr 29	25	$x(T) = b, \quad x(T) \geq b$ Quiz 5 1014-1038
15	May 4	25	Infinite Horizon $T \rightarrow \infty$ 1040-1053
	May 6		Catch Up/Review
Finals			Exam 3 , Monday, May 10 . 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.