

**Purdue University
Department of Agricultural Economics**

**Fall 2017
AGEC 654
Economic Dynamics
Course Description**

Instructors: Juan P. Sesmero and Michael E. Wetzstein

Offices: 591A and 639 Krannert

I. Intent: The course is intended to integrate economic theory with its application. The objective is to narrow the gap between theory and practice through the solving of numerical dynamic problems. These problems illustrate how to make the theory operational and how to apply numerical techniques to solve the equations, which define a potential solution.

II. Textbook: Miranda, M. and P. Fackler, *Applied Computational Economic and Finance*, MIT Press, 2002.

III. Grading:

A. Two Examinations

Midterm, October 6, 2017 - 25% of grade

Final, Friday December ?, 2017, 8:00 - ?? - 25% of grade

B. Joint Problem Sets, 25% of grade

C. Research Project, 25% of grade

**Tentative Schedule of Lecture Topics,
Problem Sets, and Examinations**

WEEK	DATE	LECTURE TOPIC	PROBLEM SETS
1	August 22	Introduction (Ch 2)	P.S. #1 Assigned
	24	Calculus of Variation (Ch 3)	
2	29	S.O.C.	
	31	Transversality Conditions	P.S. #1 Due, P.S. #2 Assigned
3	September 5	Maximum Principle (Ch 4)	
	7	Interpretation of the Necessary Conditions	P.S. #2 Due, P.S. #3 Assigned
4	12	Transversality Conditions	
	14	Example	P.S. #3 Due, P.S. #4 Assigned
5	19	Example (Conrad and Clark p. 37-40)	
	21	Dynamic Programming (Ch 5) Dynamic Programming (Conrad and Clark p. 22-24)	P.S. #4 Due, P.S. #5 Assigned
6	26	Discrete Time Dynamic Control Mine Manager Problem (Conrad and Clark p. 19-21)	P.S. #5 Due, P.S. #6 Assigned
	28	Discounting (Conrad and Clark p. 31-33)	
7	October 3	Nonlinear Equations (Miranda and Fackler, Ch 3)	
	5	Finite-Dimensional Optimization (Miranda and Fackler, Ch 4)	
	6	Midterm Examination	
8	12	Answers to Examination	P.S. #6 Due, P.S. #7 Assigned

WEEK	DATE	LECTURE TOPIC	PROBLEM SETS
9	October 17	Newton-Raphson Method	
	19	Numerical Integration and Differentiation (Miranda and Fackler, Ch 5)	
10	24	Function Approximation (Miranda and Fackler, Ch 6)	
	26	Discrete Time, Discrete State Dynamic Models (Miranda and Fackler, Ch 7)	
11	31	Method	P.S. #7 Due
	November 2	Examples	
12	7	Discrete Time, Continuous State Dynamic Models (Miranda and Fackler, Ch 8)	
	9	Method	
14	14	Examples	
	16	Discrete Time, Continuous State Dynamic Models Methods (Miranda and Fackler, Ch 9)	
15	21	Method	
1	28	Example	
	30	Real Options Analysis	
16	December 5	Basis Model	
	7	Examples	
17		Final Examination	
17	?	End of Semester Party	