

## **Topics in Microeconomics**

### **Syllabus**

This course focuses on two separate topics that have many applications in economics: decision-making under uncertainty and dynamic optimization. In the class, we will develop the theory of expected utility, discuss some of its limitations and study some applications. In addition to textbook treatments, we will also study some classic papers on these topics.

**Class:** MW 9-10<sup>th</sup> periods, GER 229

**Office Hours:** Wednesdays 10:00 am – 12:00 noon, MAT 328

For other times, please make an appointment.

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### **Prerequisites**

A course in differential equations or ECO 7408 in Fall 2016. If you have neither of these, please consult with the instructor before enrolling.

### **Requirements**

1) Problem sets: approximately one per week.

These must be turned in and your performance may affect your final grade positively if you are near a cutoff.

2) Final exam: TBA during the week of December 12-16.

### **Required Texts**

(KS) Kamien and Schwartz, *Dynamic Optimization: The Calculus of Variations and Optimal Control in Economics and Management* (North-Holland, 2<sup>nd</sup> edition, 1991)

(L) Laffont, *The Economics of Uncertainty and Information* (MIT Press, 1989)

### **Supplemental References**

These texts differ in their levels of sophistication. They do not emphasize solutions to classical equations of physics and engineering. Find one that suits your background if you need a reference.

Blume and Simon, *Mathematics for Economics* (Norton)

Sanchez, *Ordinary Differential Equations and Stability Theory: An Introduction* (Dover paperback)

Léonard and Long, *Optimal Control Theory and Static Optimization in Economics* (Cambridge paperback)

## Schedule

|                |   |              |
|----------------|---|--------------|
| 17 October     | Introduction to Decision-Making under Uncertainty |              |
| 19 October     | Expected Utility Hypothesis                       | L 1          |
| 24 October     | Expected Utility continued                        |              |
| 26 October     | Risk Aversion                                     | L 2          |
| 31 October     | More on Risk Aversion Measures                    |              |
| 2 November     | Contingent Markets                                | L 5          |
| 7 November     | Insurance   | L 8          |
| 9 November     | Introduction to Dynamic Optimization              | KS I.1-I.2   |
| 14 November    | The basic problem; the Euler equation             | KS I.3-I.4   |
| 16 November    | Free End Value, Qualitative Analysis              | KS I.8, I.17 |
| 21 November    | No class (SEA Meetings)                           |              |
| 23 November    | No class (Day before Thanksgiving)                |              |
| 28 November    | Optimal control                                   | KS II.1-II.4 |
| 30 November    | Endpoint conditions                               | KS II.5-II.7 |
| 5 December     | Discounting and infinite horizon problems         | KS II.8-II.9 |
| 7 December     | Review  |              |
| 12-16 December | <b>Final Exam</b> (TBA)                           |              |

### Supplementary Readings:

#### Uncertainty:

- Rothschild and Stiglitz, "Increasing Risk: I. A Definition," *Journal of Economic Theory* 2: 225-243 (1970)
- Rothschild and Stiglitz, "Increasing Risk: II. Its Economic Consequences," *Journal of Economic Theory* 3: 66-84 (1971)

#### Exhaustible Resources:

- Hotelling, "The Economics of Exhaustible Resources," *Journal of Political Economy* 39: 137-175 (1931)

#### Optimal Growth:

- Cass, "Optimum Growth in an Aggregative Model of Capital Accumulation," *Review of Economic Studies* 32: 233-240 (1965)

### Alternative Sources on Expected Utility:

- Akira Takayama, *Analytical Methods in Economics* (Michigan, 1993), Ch. 5, p. 255-321
- Eugene Silberberg and Wing Suen, *The Structure of Economics: A Mathematical Analysis* (3<sup>rd</sup> Edition, McGraw-Hill, 2001), Ch. 13, p. 394-417
- Ken Binmore, *Playing for Real* (Oxford, 2007), Ch. 4, p. 111-142

Access to these articles can be found in such sources as <http://www.jstor.org/> and <http://www.sciencedirect.com/science/journals> (from UF campus or using Gatorlink VPN).

Enrollment in this course constitutes acknowledgement of the following:

- 1) I understand that the University of Florida expects its students to be honest in all of their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action, up to and including expulsion from the University.
- 2) I will adhere to university copyright policies as found at <https://security.ufl.edu/learn-information-security/protect-yourself/copyright-information/>.
- 3) Students requesting classroom accommodation must first register with the Disability Resource Center. See <http://www.dso.ufl.edu/drc>.