

Fall 2018

ECON 374

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Economics 374

Professor Turner

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Mathematical Economics

Fall 2018

Section A: MWF 9:20 – 10:10

Section B: MWF 10:20 – 11:10

107 Alumni Hall

This course explores economic applications of mathematical methods, mostly calculus and matrix algebra. We will emphasize the economic applications rather than the mathematics; little of the mathematics will be new to you. The challenge for most of you will be neither the mathematics nor the economics, but the combination of the two. You will reach a deeper understanding of economic theories: we will be able to generalize in a way impossible with purely graphical presentations, we will be better able to see what factors influence comparative static results, the importance of various assumptions will be more clear, and we will in some cases extend the economic applications beyond what is usually covered in other courses. You will also be introduced to MATLAB, a software application widely used in economic theory to do numerical simulation and avoid doing mindless algebra by hand.

Text: *Mathematical Economics* by Baldani, Bradfield, and Turner (**BBT**), 3rd edition (Linus Publications, 2011) or 2nd edition (South-Western, 2005). This book is written in pairs of chapters: each pair consists of a theory chapter followed by an applications chapter. We will spend most of our class time on the applications chapters. You should read each theory chapter before we begin the classroom discussions of the relevant topic.

- Grading:**
- | | |
|-----------------------------|-----------|
| Seven quizzes (in class) | 21% total |
| Take-home exam (due Nov. 9) | 20% |
| Five problem sets | 30% total |
| Class participation | 5% |
| Comprehensive final exam | 24% |
- About every other Friday (when no problem set is due) there will be a 15-minute, in-class, closed-book quiz.
 - The take-home exam is to be done individually and, like all assignments, is covered by the Honor Code.
 - Problem sets can be done individually or in groups; the latter is probably preferable.
 - Almost every Monday and Wednesday a randomly selected student will present the solution to a problem given out after the previous class. Students should work in groups on these solutions and each group will turn in a copy of their proposed solution at the beginning of class; these will be graded simply on whether a good-faith effort has been made.
 - The final exam will be self-scheduled.

Office hours:
221 Persson Hall

Mondays 11:30 - 1:00
Thursdays 10:00 - 11:00 and 1:15 - 2:45
or by appointment (made in person or by email)

Attendance policy: Attendance is not mandatory, but most students find regular attendance is crucial to their ability to understand the course material.

Students with disabilities: If you feel you may need an accommodation based on the impact of a disability, please contact me privately to discuss your specific needs. Also, please contact Lynn Waldman, Director of Academic Support and Disability Services at 315-228-7375 (lwaldman@colgate.edu) in the Center for Learning, Teaching, and Research. Ms. Waldman reviews documentation to determine and help coordinate reasonable and appropriate accommodations for students with disabilities.

Academic Dishonesty: “Briefly stated, Colgate University defines academic dishonesty as any attempt to misrepresent one’s performance on any academic exercise submitted for evaluation...Colgate University recognizes four forms of academic dishonesty: Cheating, Fabrication (of data or sources), Facilitating Academic Dishonesty, and Plagiarism” (Source: Colgate University’s Academic Honor Code). All students are expected to abide by the Colgate Honor Code, which can be found at <http://www.colgate.edu/offices-and-services/deanofthecollege/academichonorcode>.

Course Outline, Readings, and Assignments:

Each topic will take approximately two weeks. Please read the appendix following Chapter 1 of BBT and refer back to it as necessary throughout the course. The second of each pair of BBT chapters listed below is an applications chapter. We will cover selected end-of-chapter problems in class; some other applications and end-of-chapter problems will be the basis of problem set questions. More details will be provided on Moodle.

Topic	Readings	Assignments
Optimization and Equilibrium	BBT: Ch. 1 & 2	Problem Set 1 due Fri. 9/21
Matrix Algebra and Linear Economic Models	BBT: Ch. 3 & 4	Problem Set 2 due Fri. 10/5
Multivariate Calculus	BBT: Ch. 5 & 6	Problem Set 3 due Fri. 10/19
Multivariate Unconstrained Optimization	BBT: Ch. 7 & 8	Problem Set 4 due Fri. 11/2
Constrained Optimization	BBT: Ch. 9 & 10	Take-home exam due Fri. 11/9
Difference and Differential Equations: analytics; Growth and related models	BBT: Ch. 15 & 16	Problem Set 5 due Fri. 12/7
Final Exam: self-scheduled		