Economics/Mathematics 425S: Mathematical Economics
Fall Semester, 2017

Instructors

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<th>Christina DePasquale</th>
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<td><strong>Office Hours:</strong> Mon., 2:30-4:00PM</td>
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<td>Wed., 2:30-4:00PM</td>
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Exam Dates

- Midterm Exam: Monday, October 16 (In Class)
- Final Exam: Friday, December 8, 8:00 A.M - 10:30 A.M

Pre-requisites

- Economics 201 (Intermediate Microeconomics)
- Mathematics 211 (Multivariable Calculus)
- While not a prerequisite, some knowledge of matrix algebra is useful. Math 221 and 250 will be prerequisites for this course in the very near future.

Introduction to the Course

This course is a joint Mathematics and Economics course. As such, both members of the faculty responsible for the course—Dr. Christina DePasquale of the Economics Department and Dr. Steven La Fleur of the Mathematics Department—anticipate being present at almost every class meeting. We will introduce the mathematics of optimization in this course and show how researchers use these mathematical concepts to develop testable implications of the economic models and to sharpen their understanding of economic phenomena. As a consequence, this course demands that you use economic reasoning even while you are applying mathematical techniques.
Course Grade

- Homework and participation (presentations, attendance and class participation): **25%**
- Midterm (Monday, October 16): **30%**
- Final Exam (Friday, December 8, 8:00 A.M - 10:30 A.M): **45%**

Textbook


You can purchase the most recent edition of the textbook at the on-campus Barnes & Noble or directly from the publisher (at a discount) online at

https://students.universityreaders.com/store/

The text is available either in a print version or a digital format. Note that after purchasing, you can access your partial e-book (FREE 30% PDF) by logging into your account and clicking My Digital Materials to get started on your readings right away. If you experience any difficulties, please email orders@cognella.com or call 800.200.3908 ext. 503.

Please be aware that this version of the textbook includes not only corrections of many errors that appeared in the versions used in previous semesters but also different homework problems as well as different numberings for problems; **used books are not a good substitute to purchasing this newer version and students are responsible for knowing the correct problems assigned.**

Attendance

We expect you to regularly attend class and arrive on time at 10:00. Continuously arriving late or missing class entirely on a regular basis will have a negative impact on your class participation grade. Furthermore, you are expected to be present any day your group is presenting. Missing a presentation will result in a zero for your presentation grade. Finally, when absent it is your responsibility to obtain the class notes and assignment from another student.
Homework Assignments and Presentations

Early in the semester we will split the class into groups of two to four students each. For each homework problem, one group will be assigned to present a solution to the class, and each group that is not presenting will turn in a written solution prior to the presentation. The members of the group who helped prepare the answer should put their names on it. **Signing a homework answer without contributing to the solution is an Honor Council offense, as is allowing someone else to do so.**

Please note the role of the groups in this course is very important. We will expect you to sit in every class with your group and with your name plate placed prominently on your desk. We will hand out name plates for your use once we have formed the groups.

Homework assignments and presentations are graded out of 5 points each. Homework assignments are graded on accuracy and points will be deducted for mistakes. Presentations should demonstrate that your group:

(A) can actually solve the problem and

(B) practiced presenting your solution as a group.

A good presentation will not consist simply of putting the answer or even the steps on the board. You must present the problem as though you are the teacher explaining the solution to the problem just turned in. While we do not expect your presentation to be as polished as a professor’s would, we do expect that everyone can follow along, your steps are clear, complete, and correct, and that you have practiced your presentation prior to class. Throughout the semester, all groups will get an equal number of opportunities to present answers to the problems.

Do not hesitate to come to our office hours prior to your presentation. We are happy to answer questions or give suggestions on your presentation. As problem presenters, you have extra privileges over the other groups in this regard.

A rubric for presentations can be found at the end of this syllabus.
Class Participation

We expect all students who are not presenting an answer to a question to be active members of the audience. By active we mean that you are expected to ask questions of the group presenting the answer to a question when their presentation is unclear or incorrect. We also expect you to help the students presenting the answer to a question if they get stuck.

Second, consider coming to our office hours as a group before you present and talk about your problem with us. We are happy to answer questions or give suggestions on your presentation. As problem presenters, you have extra privileges over the other groups in this regard.

Late Assignments and Make-up Exams

Late homework assignments will not be graded and our policy is to offer no makeups for the midterm. A student who fails to take the midterm at the scheduled time must obtain written permission from the Office of Undergraduate Education. Should the Office of Undergraduate Education grant permission for a student to miss the midterm, we still will not offer a makeup for the midterm. Instead, we will count the final exam as 75% of the final grade—that is, we will not offer a makeup of the midterm but will use the grade on the final as the grade for the missed midterm.

Material and Topics Covered

We will begin with a review of optimization of functions of one variable. While everyone in the class is familiar with the methods of optimizing functions of one variable, we begin with this review because almost all of the techniques we use in this relatively straightforward case reappear with the more advanced optimization techniques. After this introduction, we discuss the characterization of functions of more than one variable. This discussion covers most of the ways that economists use to analyze multivariate functions, including level curves, partial derivatives, and total derivatives. Next we introduce the techniques used to optimize multivariate functions. In particular, we discuss unconstrained optimization, optimization with equality constraints, and duality. Throughout the semester we relate the mathematics discussed in the course to key microeconomic issues including profit maximization, utility maximization, and cost minimization.
Honor Code

The honor code is in effect throughout the semester. By taking this course, you affirm that it is a violation of the code to cheat on exams, to plagiarize, to deviate from the teacher’s instructions about collaboration on work that is submitted for grades, to give false information to a faculty member, and to undertake any other form of academic misconduct. You agree that the teacher is entitled to move you to another seat during examinations, without explanation. You also affirm that if you witness others violating the code you have a duty to report them to the honor council.
Presentation Rubric

Group #: _________________________________

Preparation: 5 – 4 – 3 – 2 – 1
- The entire group understands the problem
- The group appears to have practiced the problem before presenting to the class

Restatement of the Problem: 5 – 4 – 3 – 2 – 1
- The group effectively sets up the problem by describing the setting and restating the entire question.
- The group does not just read the problem from the book nor starts the solution without restating the problem

Demonstration: 5 – 4 – 3 – 2 – 1
- The solution is presented gradually and is easy to follow
- The steps are clear and complete
- The solution is correct

Participation: 5 – 4 – 3 – 2 – 1
- Every member of the groups presents a roughly equal share of the problem
- Note: if a group member does not show up, that member will receive a zero and the rest of the group will not be penalized.

Total Weighted Score (out of 5): ______________