

## Mathematical Methods for Economic Analysis

Meeting: 1:00p-4:00p, MTWTF, Sept 5 – 22 at Physical Science 130  
 Instructor: Jijian Fan (jifan@ucsc.edu)  
 O.H.: 10:30a – 11:30a, 405G Engineer 2, or B.A.  
 Website: <http://jfan.sites.ucsc.edu/teaching/econ186/>  
 Key Dates: Midterm: Tuesday, Sept 12. Final: Friday, Sept 22.

### *About the Course*

The course will cover a wide range of material that will prepare students for the mathematics required in the economics courses of the Master program. The goal of the course is to review the main topics required for graduate-level economic analysis, and to ensure that all students enter the Fall quarter with an adequate level of mathematical preparation. Topics include: functions, basic set theory, linear algebra, derivatives and differentials, optimization (unconstrained and constrained), probability and statistics, and differential equations.

### *Lecture Schedule*

	Date	Schedule
Tue	Sept 5	Introduction and Linear Algebra 1
Wed	Sept 6	Linear Algebra 2
Thu	Sept 7	Linear Algebra 3
Fri	Sept 8	Derivatives and Differentials 1
Mon	Sept 11	Derivatives and Differentials 2
Tue	Sept 12	Taylor Series & Midterm
Wed	Sept 13	Optimization 1
Thu	Sept 14	Optimization 2
Fri	Sept 15	Optimization 3
Mon	Sept 18	Probability& Stats 1
Tue	Sept 19	Probability& Stats 2
Wed	Sept 20	Probability& Stats 3
Thu	Sept 21	Differential Equations
Fri	Sept 22	Final Exam

### *Course Readings*

Primary text: *Fundamental Methods of Mathematical Economics, 4th Edition*, by Chiang and Wainwright. This text is Master's or advanced undergraduate level and covers nearly all topics covered in the course. Much of the material, examples, and homework problems come directly from this text.

Other suggested readings include: *Mathematics for Economists*, by Simon and Blume. An excellent text used by many math-camp courses for PhD programs (including ours). Although the material is presented in a somewhat more complex manner than Chiang and Wainwright, the material is fundamentally very similar and in many cases more thorough. Excellent resource for learning more about a topic.

*Essential Mathematics for Economic Analysis*, by Sydsaeter and Hammond. Another excellent advanced-undergraduate text focusing on the mathematical tools needed for economic analysis.

*Optimization in Economic Theory*, by Dixit. This book focuses on optimization and has ample examples of the uses of optimization in economic theory. This is a great supplement to the other texts for optimization, which is a significant part of the course.

### *Grading Policy and Academic Integrity*

Problem Sets - 15%, Midterm Exam - 35%, Final Exam - 50%

Attendance is suggested but not required.

There will be daily problem sets during the course. Problem sets are due at the beginning of next lecture everyday. Late problem sets will not be accepted. There are 12 problem sets but you will be graded for your highest 10 (which means you have up to 2 chances to skip a homework).

Midterm: 2:30p-4:00p, Tuesday, Sept 12. Comprehensive Final: 1:30p-4:00p, Friday, Sept 22. Closed-book. Non-programming calculator is allowed.

All work submitted for this class must be your own. Collaboration on assignments is encouraged, but the answers you submit must be in your own words and based on your own understanding. Cheating in the exam and copying assignment answers is a violation of university policy. For more information on academic integrity at UCSC, see the following link: <http://www.ucsc.edu/academics/academic-integrity/graduate-students/index.html>