Tridip Ray
ISI, Delhi

Math 271: Mathematical Methods

Lectures: Tuesday & Thursday, 9.30 am – 11.00 am, Classroom 13

Tutorials: Monday, 2.00 pm – 3.30 pm, Classroom 13

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Office Hours:
Weekdays:
10.30 am - 1.00 pm
5.00 pm - 6.30 pm

Teaching Assistant: Prerna Dewan (prerna.dewan94@gmail.com)

Course Webpage

The webpage for the course is: http://www.isid.ac.in/~tridip/Teaching/MathEco/. Lecturenotes, homeworks, practice problems, and periodical announcements will be posted on the webpage.

Examinations

There will be three exams – two Midterms and the Final exam. Each Midterm exam will be held after each of the first two major topics, Linear Algebra and Real Analysis, are covered in class. The Final exam will be held in the Final exams period.

Homeworks, Class Tests and Tutorials

Homeworks will be assigned regularly during the semester. After discussing the material in each topic, I will specify one or two problems from each of them, and then they will accumulate as a problem set. Once a problem set is assigned, you will get one week to work on the problems.

Working out problems is an essential component to learning economics. You should feel free to discuss the problem sets with your fellow students, and in fact are encouraged to do so. However, after discussing the problems, you must prepare the answers on your own.

Solutions to the homework problems will be discussed by the Teaching Assistant in the tutorials. In the beginning of every tutorial after a homework is due, there will be an half-an-hour class test based on the homework problems.

Grading Policy

Your grade in this course will be based on the class tests, the Mid-terms, and the Final exam. The breakdown is as follows: class tests: 10%, Midterm I: 20%, Midterm II: 30%, Final exam: 40%.

Textbook

The textbook for the course is (it is **required** for the course):
Mathematics for Economists, by Carl P. Simon and Lawrence Blume, 1994, W. W. Norton & Company.

There is also another reference textbook that an interested student is encouraged to consult: *A First Course in Optimization Theory*, by Rangarajan K. Sundaram, 1996, Cambridge University Press.

Course Outline

1. **Linear Algebra:**
   - 1.1 Vectors,
   - 1.2 Matrices,
   - 1.3 Simultaneous Linear Equations,
   - 1.4 Characteristic Value Problem.
2. **Real Analysis:**
   - 2.1 Basic Concepts of Real Analysis,
   - 2.2 Differential Calculus,
   - 2.3 Convex Analysis.
3. **Classical Optimization Theory:**
   - 3.1 Unconstrained Optimization,
   - 3.2 Constrained Optimization.
4. **Modern Optimization Theory:**
   - 4.1 Concave Programming,
   - 4.2 Quasi-Concave Programming.