Mathematics for Economists

November 25, 2023

1 Brief description

This course introduces students to all the mathematical tools necessary for the study of economics at the undergraduate level. We start with preliminary topics like logic and reasoning. First few topics include set theory, linear equations and their solutions. We will learn to apply these concepts to some applications from economics. We will then cover univariate and multivariate calculus, and rules of differentiation. Some of the material will be proof-based and technical. Once basic calculus is covered, we will study optimization techniques and linear algebra. We will apply theorems from these topics to different optimization problems in Economics like the consumer's utility maximization problem.

2 Pre-Requisites

I will assume knowledge of mathematics till class 12th (as covered in the NCERT curriculum) or Calculus Enabler course.

3 Grading

10% for attendance in discussion sessions, 20% for Assignments/Quizzes and tests, 30% for midterms and 40% for finals. Bonus points for exceptional class participation. Students who consistently respond in class and offer interesting comments are eligible for bonus points purely at the discretion of the instructor.

Relative grading but conditional on thresholds being cleared. For example, if a student has top rank but has scored below 80% of the total, that student may not qualify for the highest grade. This does not mean that everyone above 80% will get the highest grade. Similar thresholds will exist for other grades as well.

3.1 Attendance Policy

Attendance is not compulsory in the lectures. However, students are strongly encouraged to attend classes. Failure to do so makes them ineligible for bonus class participation points.

Attendance in weekly held discussion sessions will be marked.

Use of laptops and mobile phones is not allowed. All handwriting-based ipads, tablets and notepads are allowed.

4 Learning outcomes:

By the end of the course students should be adept at calculating derivatives, slopes of different graphs, concavity and convexity, single variable and multivariable optimization, comparative statics. Students are expected to learn proof techniques like the method of contradiction, direct proof, contrapositive, and mathematical induction. This will set a foundation for more advanced topics in Economics.

5 Office Hours and Discussion Sessions

5.1 OH with me

1. Tuesday and Thursday: 1530-1630. (subject to change: keep checking my website - https://www.yatisharya.com/cont
2. Other by appointment (email: yatish.arya@ashoka.edu.in)

5.2 TAs: DS and OH

1. Jitendra Singh (email: jitendra.singh_phd18@ashoka.edu.in)

6 Reference textbooks:

6.1 Main textbook

Sydsaeter, Hammond and Strom, Essential Mathematics For Economic Analysis, 4th Edition, Pearson Education.

6.2 Other books

1. Sydsaeter and Hammond's, Mathematics for Economic Analysis, 2002, Pearson Education.
2. Chiang and Wainwright's Fundamental Methods of Mathematical Economics, 4th Edition, Mc-Graw Hill Education.
3. Chiang, Alpha C. "Fundamental Methods of Mathematical Economics."
4. Hoy, Livernois, McKenna, Rees, Stengos. "Mathematics for Economics", MIT Press.
5. Simon and Blume's "Mathematics for Economists", Norton Press.