

MATH METHODS FOR ECONOMISTS  
COLUMBIA UNIVERSITY ECONOMICS DEPARTMENT  
SYLLABUS FOR FALL 2023

**Course Objective.**

This course offers an introduction to mathematical tools and methods that are useful for the study of economics.

**Course Structure.**

We will meet Tuesday and Thursday mornings, 8:40-9:55 a.m. in Hamilton 503.

I will lecture twice weekly for the first half of the semester, up until October 24th. Please see the detailed lecture schedule below. Following these lectures, I will assign a take home final.

During the second half of the semester there will be occasional guest lectures from other faculty in the department (TBD). These guest lectures will be on various topics and methods that are highly relevant to economic research; these topics may include coding, experimental methods, numerical methods, and other practical skills.

**Office Hours.**

You may contact me at [jenlao@columbia.edu](mailto:jenlao@columbia.edu)

Office Hours: Mondays 3:00-4:00 pm or by appointment in IAB 1014C.

**Teaching Assistant.**

The Teaching Assistant for this course is Arslan Ali. He will hold office hours weekly and can answer questions about the material.

Arslan's email is [aza2115@columbia.edu](mailto:aza2115@columbia.edu)

**Textbooks.**

There are no required textbooks for the course. Lecture notes will be based on material drawn from the following textbooks:

Rudin, Walter (1976). *Principles of Mathematical Analysis*. 3rd Edition. McGraw-Hill; New York, New York.

Stokey, Nancy L., Robert E. Lucas Jr., with Edward C. Prescott (1989). *Recursive Methods in Economic Dynamics*. Harvard University Press; Cambridge, Massachusetts.

Mas-Colell, Andreu, Michael D. Whinston, and Jerry R. Green, (1995). *Microeconomic Theory*. Oxford University Press.

Sundaram, Rangarajan K. (1996). *A First Course in Optimization Theory*. Cambridge University Press.

Ok, Efe A. (2007). *Real Analysis with Economic Applications*. Princeton University Press.

**Course Website.**

All lecture notes, problem sets, and materials will be posted on the Courseworks website.

**Problem Set Collaboration.**

You are permitted and encouraged to collaborate with each other on the problem sets. However, in order to receive credit, each person must submit their own individual (separate) problem set.

**Grading.**

Your final grade in this course will be determined as follows:

70%  $\max\{\text{Problem Set grade, Final exam grade}\}$

30% Final Exam (take home)