ECON 8000 -- Math Camp
Vanderbilt University, Fall 2022
Professor Maria Titova

Course Objectives

The purpose of this course is to prepare students for the first-year economics PhD sequence. Some material (e.g. from real analysis, calculus, and optimization) is likely to be review for most students, while other material (e.g. basic topology, lattices, dynamic programming) may be new. The emphasis, in both lectures and assignments, will be on reading and writing rigorous mathematical arguments.

Class Schedule

Monday through Friday, 9:30 AM to 12:30 PM, from 8/2 to 8/19.

Assessment

- 20% problem sets, 4 total, 5% each
- 30% Midterm
- 50% Final Exam

Textbooks

Although the slides are self-contained, the following books may be helpful:

- *A First Course in Optimization Theory* by Rangarajan K. Sundaram
- Mathematics for Economists by Carl Simon and Lawrence Blume
- *Real Analysis* by N.L. Carothers

Course Calendar

August 2 (Tuesday)	Sets, Logic and Functions
August 3 (Wednesday)	Metric Spaces and Sequences
August 4 (Thursday)	Topology | **PS1 DUE**
August 5 (Friday)	Limits and Continuity
August 8 (Monday)	Derivative | **PS2 DUE**
August 9 (Tuesday)	Linear Algebra
August 10 (Wednesday)	Multivariate Calculus and Correspondences
August 11 (Thursday)	Review | **PS3 DUE**
August 12 (Friday)	**in-class midterm**
August 15 (Monday)	Intro to Optimization
August 16 (Tuesday)	Equality-Constrained Optimization
August 17 (Wednesday)	Inequality-Constrained Optimization
August 18 (Thursday)	Dynamic Programming: Finite Horizon
August 19 (Friday)	Dynamic Programming: Infinite Horizon | **PS4 DUE**