

Economics 7004: Mathematics for Economists

Fall 2015

Instructor

Seunghoon Lee

Office: 220 Old CE building

Office hours: Tuesday 4:30 pm – 5:30 pm or by appointment

Email: seunghoon@gatech.edu

Note: Please put EC7004 in the subject line

Lecture: Tuesday and Thursday 3:05 pm – 4:25 pm in Clough 489

Webpage: <http://tsquare.gatech.edu>

Course Description

This course intended for first year PhD students in economics. The aim of this class is to provide the fundamental mathematical tools necessary to take PhD level economics courses.

Textbooks

Mathematics for Economists, by Carl P. Simon and Lawrence Blume, 1994 (**Required**)

Mathematics for Economists, by Hoy, Michael et al., 2001

Microeconomic Theory, by Mas-Colell, Whinston, and Green, 1995

Grading Policy

Grades will be based on problem sets (10%), two in-class midterms (each 20%), participation (10%), and a final exam (40%). Exams are cumulative and closed book. Late problem sets will not be accepted. Attendance at both midterm and final exam is mandatory, and no make-up exams will be offered.

Academic Accommodation

Students who may need an academic accommodation based on the impact of a disability must initiate the request with the Office of Disability Services. Professional staff will evaluate the request with required documentation, recommend reasonable accommodations, and prepare an Accommodation Letter for faculty dated in the current semester in which the request is being made. Students should contact the Office of Disability Services as soon as possible since timely notice is needed to coordinate accommodations. Website: <http://disabilityservices.gatech.edu/>

Course Outline

- I. Introduction
 - a. Single variable calculus
- II. Linear Algebra
 - a. Row operations and reduced row echelon form (Ch. 7)
 - b. Determinant (Ch. 9 & 26)
 - c. Inverse matrix and Cramer's rule (Ch. 9 & 26)
 - d. Vector space and linear independence (Ch. 11 & 28)
 - e. Rank (Ch. 7)
 - f. Eigenvalue and eigenvector (Ch. 23)
 - g. Quadratic forms and definite matrices (Ch. 16)
 - h. Geometry in OLS
 - i. Markov Chain

Midterm I

- III. Unconstrained Optimization
 - a. Calculus of several variables (Ch. 14)
 - b. Implicit functions (Ch. 15)
 - c. Unconstrained Optimization (Ch. 17)
- IV. Constrained optimization
 - a. Equality constraints (Ch. 18)
 - b. Inequality constraints (Ch. 18)
 - c. Mixed constraints (Ch. 18)
 - d. Second Order Condition (Ch. 19)
 - e. Comparative statistics

Midterm II

- V. Economic Applications & Other Topics
 - a. Ordinary Differential Equation
 - b. Continuous time optimization
 - c. Etc.

Final Exam