

Syllabus
Mathematics for Economists
Spring Term, 2014

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Class time: Th: 10:50, F: 12:45, 14:10, 15:35
Office Hours: by appointment

Course description: Mathematics provides a powerful set of analytical tools for modern economic analysis. It quantifies the relationships between economic variables, formalizes and clarifies properties of these relationships. The goal of this course is to provide students with a working knowledge and deeper understanding of mathematical ideas, concepts and techniques for their economic analysis. The topics covered in this course include: single-variable and multivariable calculus and optimization problems, elements of linear algebra as well as their economic applications such as utility maximization, profit and cost functions, marginal products, elasticities and comparative statistics.

Course objectives: By the end of the course students should be able to: demonstrate an understanding of differential calculus, linear algebra, and optimization methods used in economics; develop mathematical intuition for economic analysis; apply mathematical techniques in building economic models and solving economic problems.

Prerequisites: MAT 227, MAT 103

Required Text: Alpha C. Chiang and Kevin Wainwright *Fundamental Methods of Mathematical Economics* 4th edition McGraw-Hill Irwin, 2005. **Recommended Text:** Carl P. Simon and Lawrence Blume *Mathematics for economists* W. W. Norton & Company, 1994.

Outline of the material to be covered in class:

1. **Linear Algebra**

Systems of linear equations, matrix algebra, determinants, vectors, linear independence.

2. **Calculus of Several Variables**

Functions of several variables, calculus of several variables, implicit functions and their derivatives

Economic applications: marginal products, elasticity, comparative statics

3. Multivariable Optimization

Unconstrained optimization, constrained optimization, homogenous and homothetic functions, concave and quasiconcave functions

Economic applications: utility maximization and demand, profit and cost, pareto optima, fundamental welfare theorems.

Communication: All course material and announcements will be posted on E-course or distributed via e-mail.

Homework assignments: There will be periodic homework assignments (as group assignments) posted on E-course. Students should form groups of 3-4 people to work on the HW assignments. The homework assignments are designed as a study guide to help you to work through the material, to enhance your understanding of the material, and to prepare you for the exams. Serious attention to the problem sets will pay off in your highest grade. Homeworks are due at the beginning of the class. No late homeworks are accepted. I will drop your lowest homework grade.

Class participation: In addition to standard lecturing class time will be devoted to working extensively on mathematical problems and their economic application. Active learning and working on in-class problems is crucial in your understanding of the material.

Exams: There will be 2 midterm exams and a final exam. All exams are closed-book and closed-note. The final exam will be comprehensive. The exams will be on the following dates:

- Midterm I: Friday, February 21
- Midterm II: Friday, March 28
- Final Exam: During the AUCA's Final Exam Week

Grading: The final grade will be based on class participation, homework assignments, 2 midterms and a final exam. A breakdown of the scoring appears below:

Task	Percent of course grade
Class participation	5 %
Homework assignments	10%
Midterm I	25%
Midterm II	25%
Final (cumulative)	35%
Total	100%

I will substitute the final exam grade for the lowest midterm exam score if it is in the favor of the student. In addition, I will drop your lowest homework grade.

Final scores out of 100 will be translated to letter grades on the following basis: A (93-100), A- (90-92.9), B+ (87-89.9), B (83-86.9), B- (80-82.9), C+ (77-79.9), C (73-76.9), C- (70-72.9), D+ (67-69.9), D (63-66.9), D- (60-62.9), E (below 60).

Absences and missing tests: If a student misses a midterm exam I will substitute the final exam grade for the missed midterm. This grading policy is designed to allow students to miss class periods if needed, for any reason. Its purpose is to allow you to manage any scheduling conflicts that may arise during the course of the semester. "Make-up" exams give an unfair competitive advantage of more preparation time to students who request a make-up. For this reason, ***I will not give make-up exams for any reason.*** Note that if you miss both midterms, the final will be weighted to adjust for the first missed midterm, and a zero will be recorded for the other midterm exam. The final exam is mandatory for all students in this course. Students who cannot take the final exam at the regularly scheduled time should not take this class.

Academic integrity: I expect students to conform to the AUCA's Honor Code. Students who are found to be cheating or appearing to be cheating will be severely penalized.

Other support: My job is to help you understand the material and I take it very seriously. I highly encourage questions from you. I am available both inside and outside of class to answer your questions and to help you master the material. You can also ask questions via e-mail: ukueva_n@mail.auca.kg.