

American University of Central Asia
Applied Mathematics and Informatics Department
Fall 2015
Syllabus – Mathematics for Economics and Business I
MAT 132, ID 2924
Course Credits 6

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I. Course Description

This course is the introduction to the basics of linear algebra and analytic geometry models. These models describe real life problems related to economics and business. The course was prepared with three related objectives: concreteness, motivation and applicability.

II. Students Learning Objectives:

The primary objectives of this course are:

- Developing abstract and logical (probative) thinking,
- Understanding how to set and solve problems,
- Acquiring a basic knowledge of linear algebra and analytic geometry,
- Ability to solve real life problems.

III. Course Policies

- a. Students are expected to **BE ON TIME** for classes. If instructor marked the student absent in case that the student is late for the class, he is considered to be absent for the whole class, unless excused by instructor.
- b. **ATTENDANCE.** Class attendance is required. If the student misses the class with an excuse, he shall provide necessary documents to prove it within a week after he/she missed a class. If the requirements mentioned above are not observed, student's absence is considered to be unexcused. If a student missed over 15 classes, he/she will not be attested for the course.
- c. **WRITTEN ASSIGNMENTS** must be submitted to instructor by the deadline. The student may submit assignment late: at the latest by the next day after the deadline before 5 pm, in that case 1 point will be deducted from the final grade for the work (e.g., if your grade is "A" for the work, after deduction, your grade will be "B"). ***This rule applies to any student who was aware or should have been aware of an assignment and the deadline no matter whether he was sick or had any other excuse on the date of a deadline.***
- d. The student has to follow **ACADEMIC HONESTY** code. All types of cheating (plagiarism etc) **are strictly prohibited**. If a student fails to observe this requirement, instructor may give from an "F" for the work up to an "F" for the whole course depending on the type of assignment and other circumstances.

IV. Assessment

a. Grading will be based on following components:

Grades will be based on a total of 100 points, coming from:

Quiz 1	The lecturer sets day and time	10 points
Midterm Exam	October, xx, 2015 (The lecturer sets day and time)	30 points
Quiz 2	The lecturer sets day and time	10 points
Final Exam	December, xx, 2015 (The lecturer sets day and time)	40 points
Home works/ Activity	Every class	10 points

b. Grading scale:

The total grade of the student is as follows:

$0 \leq F \leq 40 < D \leq 45 < C- \leq 50 < C \leq 60 < C+ \leq 65 < B- \leq 70 < B \leq 80 < B+ \leq 85 < A- \leq 90 < A \leq 100$

Make-up Exams and Quizzes

- If the reason for missing the midterm exam is valid, the student's final exam will be worth up to 60 points.
- If the reason for missing a quiz is valid, the quiz can be taken at another time and will be worth 5 points.
- If the reason for missing the Final Exam is valid, the student can apply for the grade of "I".
- If a student misses both exams, he/she will not be attested for the course.
- If the reason for missing any exam or quiz is not valid, then the grade 0 will be given for the missing exam or quiz.

Calculators and cell phones

Using graphic calculators and cell phones during quizzes and exams prohibited.

V. Miscellaneous (as needed or desired)

Prerequisites: high school mathematics.

Topics include signed numbers, operations with algebraic expressions, first-degree equations and inequalities in one variable, factoring, the Cartesian coordinate system, systems of first-degree equations in two variables solved by graphical and algebraic means, exponents and radicals, an introduction to quadratic equations, and stated problems.

VI. Textbooks and References

a. Core Texts

1. Lial M., Miller C. *Finite mathematics and calculus with applications*. -Scott, Foresman and Company. 1989.
2. Mizrahi A., Sullivan M. *Mathematics for business and social sciences*.- John Wiley & Sons. 1988.
3. Hoenig A.A. *Applied finite mathematics*. 1986.
4. Larson R.E., Hostetler R.P. *Brief calculus with applications*. -D.C. Heath and Company. 1987.
5. Grossman S.I. *Calculus of one variable*. -Academic Press. Inc. 1986.

b. Supplementary Texts

6. Aleskerov F., Esel H., Piontkovsky D. *Linear Algebra for Economist*. - Springer- Verlag Berlin Heidelberg. 2011.
7. Lay D.C. *Linear Algebra and its applications*. Pearson Education. 2012
8. Jacques I., *Mathematics for Economics and Business*.- Pearson Education Limited. 2006.
9. Renshaw G. *Maths for Economics*. - Oxford University Press. 2009.
10. Bhardwaj R. S. *Mathematics for Economics and Business*. - New Deli. 2005.
11. Valentova E. *Determinants and their use in Economics* - 2011.

VII. Tentative Academic Calendar:

Week 1-4. Systems of linear equations. Determinant. Matrix algebra, properties of matrix operations. Eigenvectors and Eigenvalues. [1]: p.90-131; [2]: p. 46-81, [5] p. A23-A32.

Week 5-6. Inverse of a matrix. [1]: p.132-142; [2]: p. 82-90.

Applications of the linear algebra methods. Cryptography. [2]: p.91-111.

Leontief's open and closed models. [6]: p. 91-114.

Week 7-8. Cartesian coordinate system on a plane. Vectors. Distance between two points. Segment division. The scalar (dot) product. Expressing a vector by the basic vectors. [1]: p. 30-64, [2]: p.2-31.

Week 9-10. The straight line on a plane. Equations of lines in Cartesian system. Point-slope form. Angle between two straight lines. Parabola, Hyperbola, Ellipse. [1]: p.43-64; [2]: p.16-38; [9]: p. 134-152.

Week 11-12. Applications. Cost-volume-profit analysis. Supply and demand, market equilibrium model.

Week 13-15. Applications. A geometric approach to linear programming problems. Optimum production output. Diet problem. Transportation problem. [1]: p. 162-188; [2]: p.115-138.