

Mathematics I – 6 ECTS

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Times: Friday, 14:00–17:00
Department: CST, Undergraduate Studies

Required Materials

- D. P. Maki, M. Thompson, *Finite mathematics*, Mc Graw Hill, 2005.
- S. T. Karris, *Mathematics for business, science and technology*, Orchard Publications, 2003.
- F. Berisha, *Leksione nga matematikë biznesi*, UEJL, Tetovë 2006.

Materials for additional reading

- R. J. Harshbarger, J. J. Reynolds, *Mathematical applications – for the managements, life, and social sciences*, Houghton Mifflin, 2000.
- L. D. Hoffmann, G. L. Bradley, *Calculus - for business economics, and the social and life sciences*, Mc Graw Hill, 2000.
- J. Slater, R. Ponticelli, *Business mathematics for college*, Irwin, 1997.
- T. Mitre, B. Ruseti, O. Stringa *Matematika I për Fakultetin Ekonomik*, Tiranë, 1990.
- D. Janev, M. Mitsevska, M. Stojanovski, K. Naumov, *Primeneta matematika: biznes i ekonomija*, Shkup, 1998.

Course Description

The course introduces the basic notions of linear models, number sequences and their applications, calculating interest and mortgages, and decision making.

Teaching delivery will be by two lectures and one exercise per week in small groups of students.

Lectures will be supported by slide presentations. At each point the previously learned concepts will be employed and reinforced. Computer applications using a spreadsheet software will be demonstrated to the students.

Student will be encouraged to active contributions in discussing and solving problems and exercises, which will be presented to them on regular basis.

Course Objectives

- To ensure that students have abilities to apply the knowledge about linear models and number sequences for solving different problems involving applications in business and economy.
- To ensure that students possess advanced knowledge about compound interest calculation, mortgages, and financial decision making.

Evaluation Policy

Each student will be evaluated at the end of the semester according to the total number of points accumulated from: exams, homework and participation into the classroom activities. The final exam includes the entire material taught during the course. The assignments will be designed to measure the students knowledge of the module content and their abilities to apply the knowledge in solving application problems. The percentage achieved by a student will be used to calculate the students final course grade as described in the table below.

Grade Scale	Grade Description	Grade Points	Letters
95%–100%	Magnificent	10	A
86%–94%	Excellent	9	A–
77%–85%	Very Good	8	B
68%–76%	Good	7	C
60%–67%	Satisfactory	6	D
59%–below	Failing	5	F

Evaluation

Assignments given to the students will be graded by the following scheme.

Assignment	Num. Points
Homeworks & Quize	20
Midterm exam	30
Final exam	40
Participation	10

Attendance Policy

Attendance is compulsory.

Academic Integrity

Cheating, in all of its forms, is strictly forbidden. Using solution keys from the previous years exam forms is considered academic dishonesty. The penalty for academic dishonesty is failing the student in the module.

Course Content

Date	Topics	References
Week 1	Numbers and arithmetic operations. Number systems. Positive and negative numbers. Addition and subtraction. Multiplication and division. Integer and fractional numbers. Reciprocals of numbers.	1. Sections 1.1–1.12 in S. T. Karris, <i>Mathematics for business, science and technology</i> .
Week 2	Elementary algebra. Introduction. Algebraic equations. Laws of exponents. Laws of logarithms. Quadratic equations. Algebraic inequalities.	1. Sections 2.1–2.11 in S. T. Karris, <i>Mathematics for business, science and technology</i> .
Week 3	Systems of linear equations. The setting and overview: linear models. Review of equations and graphs of lines. Formulation and solution of systems of linear equations in two variables.	1. Sections 5.0–5.2 in D. P. Maki, M. Thompson, <i>Finite mathematics</i> . 2. Section 3.1 in S. T. Karris, <i>Mathematics for business, science and technology</i> . 3. Sections 3.1–3.3 in F. Berisha, <i>Leksione nga matematikë biznesi</i> .

Week 4	Formulation and solution of systems of linear equations in three or more variables.	<ol style="list-style-type: none"> 1. Section 5.3 in D. P. Maki, M. Thompson, <i>Finite mathematics</i>. 2. Section 3.2 in S. T. Karris, <i>Mathematics for business, science and technology</i>. 3. Sections 3.4, 3.5 in F. Berisha, <i>Leksione nga matematikë biznesi</i>.
Week 5	Matrix algebra. The setting and overview. Matrix notation and algebra. Matrix inverses.	<ol style="list-style-type: none"> 1. Sections 6.0–6.2 in D. P. Maki, M. Thompson, <i>Finite mathematics</i>. 2. Section 3.3 in S. T. Karris, <i>Mathematics for business, science and technology</i>. 3. Section 3.6 in F. Berisha, <i>Leksione nga matematikë biznesi</i>.
Week 6	Applications in business and economics. A linear Economic Model.	<ol style="list-style-type: none"> 1. Section 6.3 in D. P. Maki, M. Thompson, <i>Finite mathematics</i>. 2. Section 3.7 in F. Berisha, <i>Leksione nga matematikë biznesi</i>.

Week 7	Linear programming: modeling and graphical solution. The setting and overview: linear optimization models. Formulation of linear programming problems. Systems of linear inequalities in two variables. Graphical solution of linear programming problems with two variables.	<ol style="list-style-type: none"> 1. Sections 7.0–7.3 in D. P. Maki, M. Thompson, <i>Finite mathematics</i>. 2. Chapter 4 in F. Berisha, <i>Leksione nga matematikë biznesi</i>.
Week 8	Number sequences. Arithmetical and geometrical progressions. Infinite sequences.	<ol style="list-style-type: none"> 1. Sections 2.18–2.21 in S. T. Karris, <i>Mathematics for business, science and technology</i>. 2. Sections 4.1–4.3 in F. Berisha, <i>Leksione nga matematikë biznesi</i>.
Week 9	Sequence limit. Number series.	<ol style="list-style-type: none"> 1. Sections 4.4, 4.5 in F. Berisha, <i>Leksione nga matematikë biznesi</i>.

Week 10	Mathematics of finance. The setting and overview. Interest. The present value of future payments.	<ol style="list-style-type: none"> 1. Sections 9.0–9.3 in D. P. Maki, M. Thompson, <i>Finite mathematics</i>. 2. Section 7.1 in S. T. Karris, <i>Mathematics for business, science and technology</i>. 3. Sections 5.1–5.3 in F. Berisha, <i>Leksione nga matematikë biznesi</i>.
Week 11	Time payments, amortization and mortgages. Sinking funds. Annuities.	<ol style="list-style-type: none"> 1. Section 9.4 in D. P. Maki, M. Thompson, <i>Finite mathematics</i>. 2. Section 7.2 in S. T. Karris, <i>Mathematics for business, science and technology</i>. 3. Sections 5.4–5.7 in F. Berisha, <i>Leksione nga matematikë biznesi</i>.

Week 12	Evaluating investment options and financial decision making. Valuation of bonds.	<ol style="list-style-type: none"> 1. Section 9.5 in D. P. Maki, M. Thompson, <i>Finite mathematics</i>. 2. Section 7.3 in S. T. Karris, <i>Mathematics for business, science and technology</i>. 3. Sections 5.8, 5.9 in F. Berisha, <i>Leksione nga matematikë biznesi</i>.
Week 13	Spreadsheet financial functions.	<ol style="list-style-type: none"> 1. Section 7.8 in S. T. Karris, <i>Mathematics for business, science and technology</i>. 2. Sections 5.10 in F. Berisha, <i>Leksione nga matematikë biznesi</i>.
Week 14	Depreciation. Depreciation rules.	<ol style="list-style-type: none"> 1. Section 8.1–8.4 in S. T. Karris, <i>Mathematics for business, science and technology</i>. 2. Sections 5.11 in F. Berisha, <i>Leksione nga matematikë biznesi</i>.