School of Business and Management Sciences / Logistics Management

2023 - 2024 Academic Year

MATHEMATICS I

Syllabus

Course Description					
Name	**Code**	**Semester**	**T+A Hour**	**Credit**	**ECTS**
MATHEMATICS I	ULY1124250	Fall Semester	3+0	3	5

Prerequisites Courses	
Recommended Elective Courses	
Language of Instruction	Turkish
Course Level	First Cycle (Bachelor's Degree)
Course Type	Required
Course Coordinator	Assist.Prof. Tuğba ASLAN KHALİFA
Name of Lecturer(s)	Lect.Dr. Yasemin YILMAZ
Assistant(s)	
Aim	The aim of this mathematics course is to equip students with the essential mathematical knowledge and skills necessary to excel in the world of business and economics. This course seeks to provide a solid foundation in mathematical concepts and techniques that are directly applicable to real-world business scenarios, enabling students to make informed decisions, solve practical problems, and enhance their quantitative reasoning abilities in a business context.
Course Content	This course contains; Number systems and algebraic expressions,Linear and quadratic equations,Linear inequalities,Applications of equations and inequalities,Definition of a function, domain, range, some special functions,Graphs of basic functions in rectangular coordinates, symmetry, translations and reflections,Linear and quadratic functions and their applications: supply and demand lines, maximum revenue,Exponential and logarithmic functions and their applications: compound interest, continuous compound interest, exponential growth ,Systems of equations,Matrix notation and matrix algebra,Operations with matrices and special matrices,Reduced matrix, solving linear systems using matrix reduction,Finding inverse of a matrix and solving linear systems using inverse matrix ,Input–output analysis.

Course Learning Outcomes	**Teaching Methods**	**Assessment Methods**
6.1Understands matrix notation, terminology and properties of these operations.		
1. Will be able to perform algebraic operations on the set of real numbers.	12, 14, 16, 9	A
1.1 Establishes relationships between operations defined on real numbers.		
1.2 Performs addition, subtraction, multiplication and division on numerical fractions, exponential numbers, and radicals.		
2. Will be able to evaluate algebraic expressions.	12, 14, 16, 9	A
2.1 Performs calculations using order of operations on algebraic expressions.		
2.2 Performs algebraic operations on both polynomial and rational expressions.		
3. Will be able to find solution sets of equations and inequalities.	12, 14, 16, 9	A
3.1 Illustrates equations and inequalities.		
3.2 Finds solution sets of equations and inequalities.		
3.3 Models problems related to the field of interest using equations and inequalities.		
4. Will be able to analyze functions.	12, 14, 16, 9	A
4.1 Understands the concept of a function and its graph, identify domain and range of a given function.		
4.2 Analyzes linear, quadratic, logarithmic, and exponential functions both algebraically and graphically.		
4.3 Obtains new function graphs by applying translation and reflection operations on basic function graphs.		
5. Will be able to interpret systems of linear equations with two or three variables.	12, 14, 16, 9	A
5.1 Modelizes the word problems in area of interest using system of equations.		
5.2 Solves systems of linear equations in two/three variables using elimination and back substitution.		
6. Will be able to establish operations defined on matrices and matrix equations of linear equation systems.	12, 14, 16, 9	A
6.2 Setups matrix equations for systems of linear equations.		
7. Will be able to analyze systems of linear equations with the help of matrices.	12, 14, 16, 9	A
7.1 Solves the system of equations with the concepts of reduced matrix and inverse matrix.		
7.2 Uses input-output matrices to analyze the amount of production of sectors of an economy.		

Teaching Methods	12: Problem Solving Method, 14: Self Study Method, 16: Question - Answer Technique, 9: Lecture Method
Assessment Methods	A: Traditional Written Exam

Lecture Schedule

Sequence	**Topics**	**Preliminary Preparation**
1	Number systems and algebraic expressions	The relevant section will be read from the book.
2	Linear and quadratic equations	The relevant section will be read from the book.
3	Linear inequalities	The relevant section will be read from the book.
4	Applications of equations and inequalities	The relevant section will be read from the book.
5	Definition of a function, domain, range, some special functions	The relevant section will be read from the book.
6	Graphs of basic functions in rectangular coordinates, symmetry, translations and reflections	The relevant section will be read from the book.
7	Linear and quadratic functions and their applications: supply and demand lines, maximum revenue	The relevant section will be read from the book.
8	Exponential and logarithmic functions and their applications: compound interest, continuous compound interest, exponential growth	The relevant section will be read from the book.
9	Systems of equations	The relevant section will be read from the book.
10	Matrix notation and matrix algebra	The relevant section will be read from the book.
11	Operations with matrices and special matrices	The relevant section will be read from the book.
12	Reduced matrix, solving linear systems using matrix reduction	The relevant section will be read from the book.
13	Finding inverse of a matrix and solving linear systems using inverse matrix	The relevant section will be read from the book.
14	Input–output analysis	The relevant section will be read from the book.

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Evaluation Methods	Weight(%)
Midterm Exam	40
General Exam	60

Resources
Main sources: 1. Lecture Notes shared by instructor 2. Main text: Introductory Mathematical Analysis for Business, Economics, and the Life and Social Sciences, 14th Edition by Ernest F. Haeussler, Jr., Richard S. Paul, and Richard J. Wood, published by Pearson Education 2019. Other Recommended Sources: Calculus for Business, Economics, Life Sciences, and Social Sciences, 14th edition Published by Pearson (2021), R. A. Barnett, M: R: Ziegler, K. E. Byleen. Fundamental methods of mathematical economics, Kevin Wainwright, 2005, McGraw Hill Education, 4th Edition İşletme Matematiği, Bülent Kobu, 2009, Beta Basım Yayım Dağıtım, 8. Edition