Course description form

1. : Course Name	
Economic mathematics	
2. :code Course Code	
ECCMA138	
3. : Semester/Year	
first stage/2023-2024/ semester	
4. : Date this description was prepared	
1/2/2024	
5. :Available forms of attendance	
My presence	
6. :(total)/number of units (total) Number of study hours	
Theoretical hours: 30 hours / Practical hours: 45, number of units: 3.5 units	
7. Name of the course administrator (if more than one name is mentioned(	

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8. objectives Course

: practical	:theoretical
The student learns how to graph demand, supply, and production functions	The student gets to know the basic concepts in mathematics
How the student distinguishes between the types of demand functions for some agricultural products and their economic variables	Shows the student the types of mathematical functions
	Explains to the student the functions of demand, supply, and production
From the elasticity of demand, the student characterizes the shape of the demand curve	Introducing the student to the types of economic functions and their mathematical formulas
From the elasticity of supply, the student distinguishes the shape of the supply curve	Shows the student the price elasticity of demand
The student distinguishes and compares the factors that lead to a shift in the demand and supply curves and the factors that lead to a change in quantity along the same curve	Methods for determining the types of price elasticity of demand through their value
	The student distinguishes and compares the types of elasticities, whether income , cross , or supply
It characterizes mathematically and graphically how market equilibrium occurs linearly	The student learns how demand and supply curves move
Distinguish mathematically and graphically how nonlinear market equilibrium occurs	The student learns about linear market equilibrium
	The student learns about nonlinear market equilibrium

The student distinguishes between the derivatives of the demand function and how to calculate them mathematically The student distinguishes between the derivatives of the cost function and how to calculate them mathematically Mathematically applies maximum limit conditions to maximize profits How to calculate the determinant, conjugate matrix, and matrix transducer The student learns about the mathematical applications of the matrix inverse in economics and economic functions	The student compares the types of economic derivatives and how to use them mathematically The student compares and differentiates between the types of economic derivatives of the production function and how to use them mathematically and graphically The student compares the types of economic derivatives of the cost function and the revenue function and how to use them mathematically The student learns about the two conditions for calculating maximum and minimum limits It applies mathematically the conditions of minimum limits in minimizing costs The student learns about matrices and their types How to add, subtract, and multiply matrices and calculate them mathematically The student learns about the determinant and its mathematical properties How to calculate the inverse of a matrix

9. Teaching and learning strategies

Interactive lecture: brainstorming, dialogue and discussion to learn the basic concepts of mathematics The interactive lecture is brainstorming, dialogue and discussion about knowing functions mathematically and structurally and their types Interactive lecture, brainstorming, clarification of economic derivatives and partial derivatives Interactive lecture and brainstorming Finding and determining linear and non-linear market equilibrium Interactive lecture, brainstorming, dialogue, and participation in estimating cost functions, revenue functions, and profits Interactive lecture, brainstorming, dialogue, and participation in estimating and .determining maximum and minimum limits and their economic applications Interactive lecture, brainstorming, dialogue and discussion, to familiarize the student with the matrix Interactive lecture, brainstorming, dialogue and discussion on how to add, subtract and multiply matrices	**The strategy**

Interactive lecture, brainstorming, dialogue and discussion, assigning tasks and reporting Interactive lecture, brainstorming, and comparison between solving the matrix using the determinant method and the matrix inverse method Interactive lecture, brainstorming, dialogue and discussion Interactive lecture, brainstorming, dialogue and discussion, assigning tasks and reporting Interactive lecture, brainstorming, dialogue and discussion He is assigned an assignment to solve some problems using matrices and their methods, such as the determinant method and the matrix inverse method He is assigned the task of solving an exercise	

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
			Course structure. 10		
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Basic concepts in mathematics Types of mathematical functions	A1The student gets to know Basic concepts in mathematics B1 shows For the student, there are types of mathematical functions	2 Theore tical	1
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Drawing mathematical functions according to their type and formula	C1 The student learns how to draw mathematical functions	3Practi cal	
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Demand and supply functions and production functions	B2 Explains the concept to the student Demand, supply and production functions	2 Theore tical	2
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	demand and supply Drawing functions and production functions	C2 The student learns how to graph demand, supply, and production functions	3Practi cal	
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Types of economic functions, countries of demand for some agricultural products	A2Students define the types of economic functions and their mathematical formulas D1 How does the student distinguish between the types of demand functions for some agricultural products and their economic variables	2 Theore tical	3
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Mathematical formulas for demand functions for agricultural	D2 Differentiates between mathematical formulas for demand functions for agricultural products	3Practi cal	

		products and their mathematical and graphic representation	D3Distinguish between its mathematical formulas How to represent it graphically		
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	price elasticity of The concept of demand Types of price elasticities of demand	B3Shows to the student Price elasticity of demand Methods for determining the types of price elasticity of demand through their value	2 Theoretical 3Practical	4
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Mathematical examples of how to calculate price elasticity of demand Draw demand curves according to their elasticity	C3 The student learns how to calculate elasticity of demand mathematically E1 The demand elasticity of demand characterizes the shape of the demand curve		
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	The concept of price elasticity of supply, income elasticity , and cross elasticity	A3 The student learns about the types of elasticities, whether income cross , or supply ، D4 The student distinguishes and compares the types of elasticities, whether income , cross , or supply	2 Theoretical	
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Mathematical calculation of price income ،elasticity of supply elasticity , cross elasticity Graphical representation of price elasticity of supply The shapes of the supply curve according to its elasticity	D5From the elasticity of supply, the student distinguishes the shape of the supply curve C4The student draws graphically the shapes of the supply curve according to its elasticity	3Practical	5

Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks	Shift of demand and supply curves, factors that lead to shift of demand and supply curves	A4 The student learns how demand and supply curves move D6 The student distinguishes and compares the factors that lead to a shift in the demand and supply curves and the factors that lead to a change in quantity on the same curve.	2 Theoretical	6
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks	Mathematical examples of shifting demand and supply curves	C5The student learns mathematical examples of shifting demand and supply curves	3Practical	
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Linear market equilibrium	A5 The student learns about linear market equilibrium	2 Theoretical	7
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Mathematical examples of linear market equilibrium	C6 characterizes mathematically and graphically how market equilibrium occurs linearly	3Practical	
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct reporting Assigning tasks and	Nonlinear market equilibrium	A 6 The student learns about nonlinear market equilibrium	2 Theoretical	8
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct reporting Assigning tasks and	Mathematical examples of nonlinear market equilibrium	C7 Distinguishes mathematically and graphically how nonlinear market equilibrium occurs	3Practical	
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Use of economic derivatives The derivative of the demand and income function	The student learns about economic derivativesA6 The derivative of the demand and functions income	2 Theoretical	9

			D7 The student compares the types of economic derivatives and how to use them mathematically		
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Mathematical examples and the use solutions to exercises on of economic derivatives The derivative of the demand and income function	E2 The student distinguishes between the derivatives of the demand function and how to calculate them mathematically	3Practical	
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks	its The production function and economic derivatives	A7 The student learns about the production function and its difficulties D8 The student compares and differentiates between the types of economic derivatives of the production function	2 Theoretical	
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks	Mathematical examples and exercises on how to calculate the values of economic derivatives of the production function Chart of economic derivatives	C8 how to The student learns calculate the values of the economic derivatives of the production function E3 is trained on an economic derivatives chart	3Practical	10
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	derivatives of the The concept of cost function and the revenue d function	A8 Identify the cost and revenue function and its derivatives D9 The student compares the types of economic derivatives of the cost function and the revenue function and how to use them mathematically	2 Theoretical	11

Assessment	Teaching methods	Content	Learning outcomes	Hours/Type	Week
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Mathematical examples of derivatives of cost and revenue functions Graph of cost function derivatives	E4The student distinguishes between the derivatives of the cost function and how to calculate them mathematically C9 The student learns to graph it	3Practical	
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Maximum and minimum ends, maximizing profits, minimizing costs	A9 The student learns about the two conditions for calculating maximum and minimum limits and the concept of maximizing profits and minimizing costs	2 Theoretical	
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Mathematical application and mathematical examples of maximum and minimum limits Exercises on maximizing profits Cost minimization exercises	C10 Mathematically applies maximum limit conditions in profit maximization C11It applies mathematically the conditions of minimum limits in minimizing costs	3Practical	12
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Matrices, types of matrices, addition, subtraction, multiplication of matrices	A10The student learns about matrices and their types C12 How to add, subtract, and multiply matrices and calculate them mathematically	2 Theoretical	
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Illustrative mathematical examples of algebraic operations for matrices	C13 The student applies mathematical examples of algebraic operations for matrices	3Practical	13
Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Determinants, their properties, the accompanying matrix	A11 The student learns about the determinant and its mathematical properties	2 Theoretical	14

Short exams Assignment of duty discussions	Auditory methods Style of writing on the blackboard Dialogue style Direct Assigning tasks and reporting	Mathematical examples and exercises about determinants and how to calculate them	C14 How to calculate the determinant, conjugate matrix, and matrix transducer	3Practical	
Short exams Assignment of duty discussions	Writing style on Auditory methods Dialogue style Direct the blackboard and reporting Assigning tasks	Matrix inverse and its economic applications	A11 The student learns about the concept of matrix inverse and its economic applications	2 Theoretical	15
Short exams Assignment of duty discussions	Writing style on Auditory methods Dialogue style Direct the blackboard and reporting Assigning tasks	Mathematical examples and exercises on matrix inverses and their economic applications	C15 The student learns how to calculate the inverse of a matrix and apply this to economic functions	3Practical	

Course evaluation -

Relativ e weight %	Class	Calendar a week -appointment	Calen dar metho ds	Т
5	5	15-1 My theory week	Final theore tical report +	1
10	5 5	Week 3	Quiz Short test 1	2
15	10 5	Week 9	Midterm test and Theoretical practical	3
10	5 5	Week 12	Short test 2 Quiz	4
20	20	Pract ical exam week	Final practic test al	5
40	40	A week of theor etical exam	Final theore tical test	
100	100		the total	

Learning and teaching resources

Mathematical Economics, Dr. Adnan Abdul Karim Najm

Introduction to Mathematical Economics, Dr. Atheel Abdul-Jabbar Al-Joumard

Theoretical subject teacher Practical subject teacher Practical subject teacher

M.D. Ahmed Hashem Ali MD. Walid Ibrahim Sultan M.M. Farah Mohsen Ali

Chairman of the Scientific Committee Head of the Agricultural Economics Department

Prof. Dr. Alaa Muhammad Abdullah, Prof. Dr. Alaa Muhammad Abdullah

جامعة الموصل

كلية الزراعة والغابات

قسم الاقتصاد الزراعي