Identification	Subject	MATH 215 Linear Algebra and Mathematical	
		Analysis, 6 ECTS	
	Department	Mathematics	
	Program	Undergraduate	
	Term	Fall 2023	
	Instructor	Khanim Omaroglu	
	E-mail:	khnabiyeva@khazar.org	
	Phone:	012- 422- 24- 97	
	Classroom/hours	Monday 11:50-13:20, Wednesday 11:50-13:20	
	Office hours		
Prerequisites	The prerequisites are high school algebra and trigonometry. Prior		
		culus is helpful but not necessary.	
Language	English		
Compulsory/Elective	Compulsory		
Description		Analytic Geometry is a major course at School of	
		nagement. This introductory course covers two content	
		ra and Mathematical Analysis. This introductory course	
	covers differentiation, matrix operations, determinants and systems		
Deguined toythooks	of linear equations.		
Required textbooks and course materials	1. George Thomas, et al, Thomas' Calculus: Early Transcendental,		
and course materials	12th edition, Addison-Wesley (2010), (http://libgen.org/)		
	2. V.V. Konev. Linear Algebra, Vector Algebra and Analytical Geometry, Textbook. Tomsk: TPU Press, 2009, 114 pp.		
		Lay, Linear Algebra and its Applications. 4 th edition,	
	2012	and the representation is contained.	
	Supplementary book		
	1. James Stewart, Essential calculus. Early transcendentals, Second		
	Edition, Brooks/Cole (2013)(http://libgen.org/)		
	2. Poole, D., I	Linear algebra: a modern introduction. 4 th Edition, 2014.	
Course website			
Course outline	Linear algebra and	Langlytia geometry is a major course at Cahool of	
Course outilile	Linear algebra and analytic geometry is a major course at School of		
		anagement. This introductory course covers two	
	content areas: Linear Algebra and Mathematical analysis. This		
	introductory course covers differentiation, matrix operations,		
	determinants and systems of linear equations.		
Course objectives	The concepts of limit; tangent to curve; differentiation; chain rule;		
Course objectives	calculations of determinants, matrix operations, Systems of linear		
	equations, Gaussian elimination.		
Lagraina autoomos	Upon suggessful a	omplation of this course students should be able:	
Learning outcomes	opon successful co	ompletion of this course, students should be able:	
	To find limit	it of functions at points and infinity; to find	
	asymptotes of graphs		
	To determine if a given function continuous or discontinuous		
	at a point		
	at a point		
	To find deri	vative of function by using its' definition;	

	T 1 1:00					
	To know different	To know differentiation rules and be able to apply them to				
	problems	problems				
	To find derivativ	To find derivative as a rate of change				
	To define derivate	To define derivative of trigonometric functions				
	To find derivative	To find derivative of compound functions by chain rule				
	To know implicit	To know implicit differentiation and be able to apply it to				
		variety problems				
		• •				
		To find derivative of inverse functions by using inverse				
		function theorem				
		To solve operations on matrix				
	To calculate dete	To calculate determinants				
	• To find inverse n	To find inverse matrix				
	• To solve system	To solve system of linear equations by using Cramer's rule				
	To find rankof m	To find rankof matrix				
	• To solve system	To solve system of linear equations by using Gaussian				
	elimination.	elimination.				
Teaching methods	Lecture	να				
reaching methods		riential exercise				
1	Experiental exercise					
	Assisted work		X			
	-		X X			
	Assisted work					
Evaluation	Assisted work Assisted lab work Others Methods	Date/deadlines	Percentage (%)			
Evaluation	Assisted work Assisted lab work Others Methods Midterm Exam	Date/deadlines	Percentage (%)			
Evaluation	Assisted work Assisted lab work Others Methods Midterm Exam Class Participation	Date/deadlines	x Percentage (%) 30 5			
Evaluation	Assisted work Assisted lab work Others Methods Midterm Exam Class Participation Quizzes	Date/deadlines	x Percentage (%) 30 5 20 (3 quizzes)			
Evaluation	Assisted work Assisted lab work Others Methods Midterm Exam Class Participation Quizzes Activity	Date/deadlines	x Percentage (%) 30 5			
Evaluation	Assisted work Assisted lab work Others Methods Midterm Exam Class Participation Quizzes Activity Project	Date/deadlines	x Percentage (%) 30 5 20 (3 quizzes) 5			
Evaluation	Assisted work Assisted lab work Others Methods Midterm Exam Class Participation Quizzes Activity Project Final Exam	Date/deadlines	x Percentage (%) 30 5 20 (3 quizzes) 5 - 40			
	Assisted work Assisted lab work Others Methods Midterm Exam Class Participation Quizzes Activity Project Final Exam Total		x Percentage (%) 30 5 20 (3 quizzes) 5 - 40 100			
Evaluation Policy	Assisted work Assisted lab work Others Methods Midterm Exam Class Participation Quizzes Activity Project Final Exam Total NO CELL PHONES a	re allowed during lecture an	x Percentage (%) 30 5 20 (3 quizzes) 5 - 40 100 d lab sessions.			
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	Assisted work Assisted lab work Others Methods Midterm Exam Class Participation Quizzes Activity Project Final Exam Total NO CELL PHONES a PLEASE turn them off This is a university pol accordingly. No late assignments winstructor for acceptable	re allowed during lecture and f before lecture! (Not silent olicy and violators will be repill be accepted without prior le excuses. Medical and fam	Percentage (%) 30 5 20 (3 quizzes) 5 - 40 100 d lab sessions. or vibrating mode). orimanded			
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- If students should miss class due to personal emergency or medical reasons, please notify the instructor by email immediately. A doctor's note will be required for make-up work.
- Students are responsible for completing the reading assigned from the textbook related to the covered topics and for checking email regularly for important information and announcements related to the course.
- University policy on academic honesty concerning exams and individual work will be strictly enforced.
- BE ON TIME!

Tentative Topics	Week	Date/Day	Touring	Toroth a alv/A asign
20.09.2023 • Rates of Change and Tangents to Curves Limit of a Function and Limit Laws [1] Ch. 2.1, 2.2	vveek	(Tentative)	Topics	_
1 20.09.2023		18.09.2023		
2	1	20.09.2023		[1] Ch.2.1, 2.2
27.09.2023 Practice	2	25.09.2023	The Precise Definition of a Limit	
One-Sided Limits Continuity	2	27.09.2023		[1] Ch. 2.3
04.10.2023 Continuity		02.10.2023	One-Sided Limits	[1] Ch. 2.4, 2.5
Limits Involving Infinity; Asymptotes of Graphs	3	04.10.2023		
11.10.2023 Tangents and the Derivative at a Point	4	09.10.2023	Limits Involving Infinity: Asymptotes of Graphs	[1] Ch. 2.6, 3.1,
The Derivative as a Function Company	4	11.10.2023		
18.10.2023 Differentiation Rules Quiz 1 (6 pts)	5	16.10.2023	The Derivative as a Function	[1] Ch. 3.2.3.3
The Derivative as a Rate of Change Derivatives of Trigonometric Functions The Chain Rule Implicit Differentiation Derivatives of Inverse Functions and Logarithms The Chain Rule Implicit Differentiation Derivatives of Inverse Functions and Logarithms The Chain Rule Implicit Differentiation Derivatives of Inverse Functions and Logarithms The Chain Rule Implicit Differentiation Derivatives of Inverse Functions and Logarithms The Chain Rule Implicit Differentiation Derivatives of Inverse Functions and Logarithms The Chain Rule		18.10.2023		
25.10.2023 Derivatives of Trigonometric Functions [1] Ch. 3.4, 3.5 30.10.2023 The Chain Rule Implicit Differentiation Derivatives of Inverse Functions and Logarithms 06.11.2023 Midterm Exam Holiday 13.11.2023 Inverse Trigonometric Functions [1] Ch. 3.6, 3.7, 3.8 15.11.2023 Inverse Trigonometric Functions Systems of Linear Equations: Basic Concepts, Gaussian Elimination, Homogeneous Systems of Linear Equations 20.11.2023 Matrices: Basic definitions, Matrix operations, Types of matrices, Kronecker Delta Symbol, Properties of Matrix Operations Determinants Permutations and Transpositions, Determinant General Definition, Properties of Determinants 27.11.2023 Determinant Calculation [2] p. 31-35 29.11.2023 Inverse matrices: Three Lemmas, Theorem of Inverse Matrix, Calculation of Inverse Matrices by Elementary Transformations 10	6	23.10.2023	The Derivative as a Rate of Change	[1] Ch. 3.4, 3.5
Total Content	U	25.10.2023		
01.11.2023 06.11.2023 08.11.2023 08.11.2023 15.11.2023 10 20.11.2023 10 20.11.2023 20.11.2023 10 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.2023 20.11.	7	30.10.2023		[1] Ch. 3.6, 3.7,
 Midterm Exam Holiday 13.11.2023 Inverse Trigonometric Functions Systems of linear equations: Basic Concepts,				
9 13.11.2023 • Holiday 15.11.2023 • Inverse Trigonometric Functions • Systems of linear equations: Basic Concepts, Gaussian Elimination, Homogeneous Systems of Linear Equations 10 20.11.2023 • Matrices: Basic definitions, Matrix operations, Types of matrices, Kronecker Delta Symbol, Properties of Matrix Operations • Determinants: Permutations and Transpositions, Determinant General Definition, Properties of Determinants 11 27.11.2023 • Determinant Calculation 12 04.12.2023 • Inverse matrices: Three Lemmas, Theorem of Inverse Matrix, Calculation of Inverse Matrices by Elementary Transformations 13 11.12.2023 • Matrix Rank • Problem solving 14.53	Q	06.11.2023	Midterm Exam	
10 20.11.2023 • Matrices: Basic definitions, Matrix operations, Types of matrices, Kronecker Delta Symbol, Properties of Matrix Operations, Determinants General Definition, Properties of Determinants 10 27.11.2023 • Determinant Calculation 11 27.11.2023 • Determinant Calculation 12 04.12.2023 • Inverse matrices: Three Lemmas, Theorem of Inverse Matrix, Calculation of Inverse Matrices by Elementary Transformations 13 11.12.2023 • Matrix Rank • Problem solving [2] p. 43-53	O	08.11.2023	• Holiday	
15.11.2023 • Systems of linear equations: Basic Concepts, Gaussian Elimination, Homogeneous Systems of Linear Equations • Matrices: Basic definitions, Matrix operations, Types of matrices, Kronecker Delta Symbol, Properties of Matrix Operations • Determinants: Permutations and Transpositions, Determinant General Definition, Properties of Determinants 11 27.11.2023 • Determinant Calculation 12 04.12.2023 • Inverse matrices: Three Lemmas, Theorem of Inverse Matrix, Calculation of Inverse Matrix, Calculation of Inverse Matrices by Elementary Transformations 13 11.12.2023 • Matrix Rank • Problem solving [2] p. 43-53		13.11.2023		
Gaussian Elimination, Homogeneous Systems of Linear Equations 10 20.11.2023 22.11.2023	9	15.11.2023	C	[1] Ch 3 0
Types of matrices, Kronecker Delta Symbol, Properties of Matrix Operations Determinants: Permutations and Transpositions, Determinants 27.11.2023 29.11.2023 Od.12.2023 Inverse matrices: Three Lemmas, Theorem of Inverse Matrix, Calculation of Inverse Matrices by Elementary Transformations Inverse Matrix Rank Matrix Rank Problem solving Types of matrices, Kronecker Delta Symbol, Properties of Matrix Operations [2] p. 7-19 [2] p. 20-30 [2] p. 31-35 [2] p. 31-35 [2] p. 36-42 [2] p. 31-35			Gaussian Elimination, Homogeneous Systems of	
Properties of Matrix Operations Determinants: Permutations and Transpositions, Determinants 11 27.11.2023 29.11.2023 O4.12.2023 O6.12.2023 Properties of Matrix Operations Determinants Properties of Matrix Operations Determinant General Definition, Properties of Determinants Potential Definition, Properties of Determinant Calculation [2] p. 20-30 [2] p. 31-35 [2] p. 36-42 Inverse matrices: Three Lemmas, Theorem of Inverse Matrix, Calculation of Inverse Matrices by Elementary Transformations 11.12.2023 Matrix Rank Problem solving Quiz-3 (7 pts) [2] p. 43-53		20.11.2023		Quiz-2 (7 pts)
 Determinants: Permutations and Transpositions, Determinant General Definition, Properties of Determinants 27.11.2023 Determinant Calculation [2] p. 31-35 04.12.2023 Inverse matrices: Three Lemmas, Theorem of Inverse Matrix, Calculation of Inverse Matrices by Elementary Transformations 11.12.2023 Matrix Rank Problem solving Quiz-3 (7 pts) [2] p. 43-53 	10	22.11.2023		
Determinants 27.11.2023 29.11.2023 • Determinant Calculation [2] p. 31-35 12 04.12.2023 06.12.2023 • Inverse matrices: Three Lemmas, Theorem of Inverse Matrix, Calculation of Inverse Matrices by Elementary Transformations 11.12.2023 • Matrix Rank • Problem solving [2] p. 36-42 [2] p. 36-42 [2] p. 36-42			 Determinants: Permutations and Transpositions, 	[2] p. 20-30
 Determinant Calculation 29.11.2023 O4.12.2023 Inverse matrices: Three Lemmas, Theorem of Inverse Matrix, Calculation of Inverse Matrices by Elementary Transformations Matrix Rank Problem solving Quiz-3 (7 pts) p. 43-53 				
29.11.2023 O4.12.2023 O6.12.2023 Inverse matrices: Three Lemmas, Theorem of Inverse Matrix, Calculation of Inverse Matrices by Elementary Transformations 11.12.2023 Matrix Rank Problem solving Quiz-3 (7 pts) [2] p. 31-33	11	27.11.2023	• Determinant Calculation	
12 Inverse Matrix, Calculation of Inverse Matrices by Elementary Transformations 11.12.2023 • Matrix Rank • Problem solving [2] p. 43-53		29.11.2023	• Determinant Calculation	[2] p. 31-35
06.12.2023 Matrices by Elementary Transformations 11.12.2023 • Matrix Rank • Problem solving [2] p. 43-53		04.12.2023		[2] p. 36-42
13 • Problem solving [2] p. 43-53	12	06.12.2023	,	
13.12.2023 • Problem solving [2] p. 43-53	12	11.12.2023		
	13	13.12.2023	Froblem solving	[2] p. 43-33

14	18.12.2023 20.12.2023	 Cramer's Rule, Cramer's General Rule Problem solving 	[2] p. 54-59
15	25.12.2023 27.12.2023	 Cramer's Rule, Cramer's General Rule Problem solving 	[2] p. 54-59
	TBA	Final Exam	

This syllabus is a guide for the course and any modifications to it will be announced in advance.