	_		Lecture	Seminar	Lab.			
Course Code	Course Type	Regular Semester	(hours/we ek)	(hours/we ek)	(hours/we ek)	Credits	ECTS	
CMP 112	А	Spring	3.00	1.00	0.00	3.50	5.00	
Lecturer Vladimir Muka, Msc								
	Assistant	Sadije Bushati, Prof. Dr						
Course language		Albanian						
	Course level	Bachelor						
	Applications of Linear algebra continue to spread to more and more fields. Lar due to the computer revolution of the last 75 years, linear algebra has risen to role of prominence in the mathematical curriculum rivaling that of calculus. Modern software has also made it possible to dramatically improve the way th course is taught. The main concepts addressed in the linear algebra course ar Systems of Linear Equations. Euclidean Space. Matrices. Subspaces. Determinants. Eigenvalues and Eigenvectors. Vector Spaces. Linear Transformations					risen to a ulus. way the		
	Objectives							
Co	ore Concepts	Equations of the first degree with two variables and graphic representation; systems of linear equations and Gauss-Jordan method; implementation in electric network situations; matrx equations and their application in solving linear equation systems.						
Course Outlir	ie							
Week				Topic				
1	systems using homogeneous Edition, page David Hill (20 David C. Lay,	rstems of linear equations, Augmented Matrix. Row reduction and echelon forms, The Solving stems using Gauss elimination. Solving a system using Gauss-Jordan elimination. System of omogeneous linear equation. Mark Dugopolski, (2009) Algebra for College Students, fifth lition, page 256-275 Robert Blitzer (2018). College algebra, page 542-678. Bernard Kolman, avid Hill (2007) Elementary Linear Algebra with Applications, nine Edition, page 14-99 Lay, avid C. Lay, Steven R. McDonald, Judith (2016) Linear Algebra and Its Applications, page 1-24 dapted lectures in Albanian: Linear Algebra. Vladimir Muka						
2	Introduction to vectors (geometric). Properties of Vector Operations. Vector equations, Solution sets of linear systems, Parametric Vector Form, Applications of linear systems, Lay, David C. Lay, Steven R. McDonald, Judith (2016) Linear Algebra and Its Applications, page 25-63 Howard Anton, Cris Rorres (2008). Elementary Linear Algebra with Applications nine Edition,page 184-253 Adapted lectures in Albanian: Linear Algebra. Vladimir Muka							
3	Linear independence of vectors. Linear Independence of Matrix Columns. Introduction to linear transformations. The matrix of a linear transformation. Geometric Linear Transformations of R2. Lay, David C. Lay, Steven R. McDonald, Judith (2016) Linear Algebra and Its Applications, page 56-81 Howard Anton, Cris Rorres (2008). Elementary Linear Algebra with Applications nine Edition page, 257-278 Adapted lectures in Albanian: Linear Algebra. Vladimir Muka							
4	Matrices. Matrix Operations. Matrix Multiplication. Algebraic Properties of Matrix Operations. Elementary Matrices. Equivalent Matrices. Bernard Kolman, David Hill (2007) Elementary Linear Algebra with Applications, nine Edition, page 24-62, 130-143 Gareth Williams (2019) Linear Algebra with Applications- nine Edition, page 69-102 Adapted lectures in Albanian: Linear Algebra. Vladimir Muka							

5	Special Matrices and Transposes. Matrix Inverses. Finding A-1. Partitioned matrices. Solve systems using matrix equations. Dimension and rank Robert Blitzer (2018). College algebra, faqe 620-670 Mark Dugopolski, (2009) Algebra for College Students, fifth Edition, faqe 226-255 Thomas S. Shores (2007) Applied Linear Algebra and Matrix Analysis, page 86-106 Lay, David C. Lay, Steven R. McDonald, Judith (2016) Linear Algebra and Its Applications, page 118-162 Steven Leon, Lisette de Pillis (2021) Linear Algebra with Applications, tenth edition, page 41-85 Adapted lectures in Albanian: Linear Algebra. Vladimir Muka			
6	The determinant of a matrix. Properties of determinants, Cofactor expansion, Application to computing areas, Inverse of a matrix, Other applications of determinants. Steven Leon, Lisette de Pillis (2021) Linear Algebra with Applications, tenth edition, page 101-120 Bernard Kolman, David Hill (2007) Elementary Linear Algebra with Applications, nine Edition, page 154-185 Adapted lectures in Albanian: Linear Algebra. Vladimir Muka			
7	Cramer's Rule, volume, and linear transformations, Eigenvectors and eigenvalues, The characteristic equation, Diagonalization, Eigenvectors and linear transformations Robert Blitzer (2018). College algebra. Miami Dade College, faqe 670-678 Mark Dugopolski, (2009) Algebra for College Students, fifth Edition, faqe 256-275 Lay, David C. Lay, Steven R. McDonald, Judith (2016) Linear Algebra and Its Applications page 179-189, 267-297 Larry E. Knop - Linear Algebra, (2008). A First Course with Applications, page 597-615 Steven Leon, Lisette de Pillis (2021) Linear Algebra with Applications, tenth edition, page 308-353 Adapted lectures in Albanian: Linear Algebra. Vladimir Muka			
8	Semi-final exam			
9	Euclidean vector spaces. Vector space axioms. The Vector Space Rmn. Vector spaces of functions Pn. Steven Leon, Lisette de Pillis (2021) Linear Algebra with Applications, tenth edition, page 126-147 Howard Anton, Cris Rorres (2008). Elementary Linear Algebra with Applications nine Edition, page 257-368 Bernard Kolman, David Hill (2007) Elementary Linear Algebra with Applications, nine Edition, page 190-221 Adapted lectures in Albanian: Linear Algebra. Vladimir Muka			
10	Linear Independence. Subspaces. The span of a set of vectors. Basis and dimension. Change of Basis. Row space and column space of matrix. Steven Leon, Lisette de Pillis (2021) Linear Algebra with Applications, tenth edition, page 148-186 Bernard Kolman, David Hill (2007) Elementary Linear Algebra with Applications, nine Edition, page 222-257 Adapted lectures in Albanian: Linear Algebra. Vladimir Muka			
11	Linear transformations from Rn to Rm. Properties of linear transformations from Rn to Rm. Linear transformations and polynomials. One-to-One and Onto Linear Transformations. Isomorphisms. Howard Anton, Cris Rorres (2008). Elementary Linear Algebra with Applications nine Edition, page 279-593 Jeffrey Holt (2013) Linear Algebra with Applications, page 353-364 Adapted lectures in Albanian: Linear Algebra. Vladimir Muka			
12	Kernel and Range of a linear transformation. Inverse linear transformations. Similarity. Introduction to Homogeneous Coordinates. Gareth Williams (2019) Linear Algebra with Applications- nine Edition, page 272-296 Howard Anton, Cris Rorres (2008). Elementary Linear Algebra with Applications nine Edition, page 574-661 Adapted lectures in Albanian: Linear Algebra. Vladimir Muka			
13	Coordinate Vectors. Matrix Representations of Linear Transformations. Relations Between Matrix Representations. Quadratic Form. Gareth Williams (2019) Linear Algebra with Applications- nine Edition, page 299-346 Bernard Kolman, David Hill (2007) Elementary Linear Algebra with Applications, nine Edition, page 266-388 Adapted lectures in Albanian: Linear Algebra. Vladimir Muka			
14	Inner Product Spaces. Non-Euclidean Geometry and Special Relativity. Approximation of Functions and Coding Theory. Least Squares Solutions. Applications of Inner Products. Gareth Williams (2019) Linear Algebra with Applications- nine Edition page 349-383 Jeffrey Holt (2013) Linear Algebra with Applications, page 379-398 Adapted lectures in Albanian: Linear Algebra. Vladimir Muka			
15	Review			
16	Final Exam			
<u> </u>				

Prerequisites	The student must attend the course at a minimum rate of 75%.		
Literature	Leksione te pershtatura ne shqip: Algjebra lineare-Vladimir Muka		
References	<ul> <li>Mark Dugopolski, (2009) Algebra for College Students, fifth Edition</li> <li>Robert Blitzer (2018). College algebra. Miami Dade College</li> <li>Gareth Williams (2019) Linear Algebra with Applications- nine Edition</li> <li>Steven Leon, Lisette de Pillis (2021) Linear Algebra with Applications, tenth edition</li> <li>Lay, David C. Lay, Steven R. McDonald, Judith (2016) Linear Algebra and Its Applications</li> <li>Larry E. Knop - Linear Algebra, (2008). A First Course with Applications</li> <li>Howard Anton, Cris Rorres (2008). Elementary Linear Algebra with Applications nine Edition</li> <li>Jeffrey Holt (2013) Linear Algebra with Applications</li> <li>Thomas S. Shores (2007) Applied Linear Algebra and Matrix Analysis</li> <li>Bernard Kolman, David Hill (2007) Elementary Linear Algebra with Applications, nine Edition</li> </ul>		

## **Course Outcome**

1

Studentet te dine te modelojme matematikisht situata profesionale qe cojne ne sisteme ekuacionesh lineare

## **Course Evaluation**

In-term Studies	Quantity	Percentage
Midterms	1	35
Quizzes	1	10
Projects	0	0
Term Projects	0	0
Laboratory	0	0
Class Participation	1	5
Total in-term evaluation percent		50
Final exam percent		
Total		

## **ECTS Workload (Based on Student Workload)**

Activities	Quantity	Duration (hours)	Total (hours)
Course duration (Including the exam week: 16x Total hours of the course)	16	4	64
Study hours outside the classroom (Preparation, Practice, etc.)	14	2	28
Duties	0	0	0
Midterms	1	10	10
Final Exam	1	15	15
Other	1	3	3
Total Work Load			
Total Work Load / 25 (hours)			
ECTS			5.00