

Department of "Mechanics and Mathematics"

Course Unit Title	Linear Algebra and Analytic Geometry	
Course Unit Code	IF-BO1	
Type of Course Unit	Compulsory	
Level of Course Unit	1 st year	
National Credits		
Number of ECTS Credits Allocated	3	
Theoretical (hours/week)	1	
Practice (hours/week)	1	
Laboratory (hours/week)		
Year of Study	1	
Semester when the course unit is delivered	1	
Course Coordinator	Taghiyev Rauf Mursal	
Name of Lecturer(s)	Taghiyev Rauf Mursal	
Name of Assistant(s)	-	
Delivery Method	Face to Face	
Language of Instruction	Azerbaijani, English	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
<p>The teaching of the subject "Linear Algebra and Analytical Geometry" is intended to teach students the basic concepts of the subject, to master basic knowledge about the matrix calculus of mathematics, methods for solving systems of linear equations, vector calculus, finding and applying analytical expressions for straight lines and curves in the plane and space. These, in turn, play an important role in teaching other subjects. The course consists of theoretical and seminar lessons. Here, the application of all theorems and properties is reflected in practical exercises.</p>		
Course Objectives:		
<p>Elements of "linear algebra and analytical geometry" are applied in computing, programming, and various fields of economics. Therefore, specialists in the given areas must master the basics of this subject.</p>		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Teaching higher mathematics together with other fundamental sciences allows for the development of students' intellectual potential and the formation of creative personalities who successfully function in the modern system of relations.	1, 2

Assessment Methods: 1. Final Exam, 2. Presentation			
Course's Contribution to the Program			
			CL
1	ability to work with automated and integrated computer technologies, which allows you to effectively solve problems in various fields		4
2	ability to apply ICT (Information and Communication Technology) capabilities in various fields of activity, using knowledge in related sciences, language skills and information technology		3
3	ability to function effectively in a team, the members of which together provide leadership, create a collaborative and inclusive environment, set goals, plan tasks and achieve goals		3
4	ability to use applications and special software packages to manage various technological processes that help increase productivity, improve the quality and safety of technological operations in various industries		3
5	ability to apply computer engineering component design methods in the field of computer engineering and develop new solutions, improving the overall performance and reliability of systems		4
6	ability to use programming languages and software development systems and solve computer engineering problems, create innovative solutions for various applications and devices		3
7	ability to develop tools based on computer graphics, multimedia and virtual reality technologies to create interactive systems and applications in various fields		2
8	ability to develop, test and manage databases, user interfaces and information system modules that help ensure efficient data storage and processing, as well as the integration of various technological solutions to solve practical problems		2
9	ability to recognize ethical and professional responsibilities in engineering situations and to make informed judgments that must take into account the impact of engineering decisions in various fields		3
10	ability to use foreign language skills to obtain the necessary information of a scientific and technical nature. Ability to use a foreign language to prepare presentations and in oral speech		3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)			
Course Contents			
Week	Chapter	Topics	Exam
1		The concept of a matrix. Operations on matrices. Determinants of two and three orders. Basic properties of the determinant. Minor and algebraic complements	
2		Seminar 1	
3		Inverse matrix. Elementary transformations on a matrix. Rank of a matrix. n-order determinants	
4		Seminar 2	

5		System of linear equations. Methods for solving a system of linear equations: Cramer's rules, matrix method	
6		Seminar 3	
7		Gaussian method. System of linear equations in n-unknowns, Kronecker-Capelli theorem	
8		Seminar 4	
9		The concept of a vector. Scalar, vectorial and mixed products of vectors	
10		Seminar 5	
11		Equations of a straight line on a plane	
12		Seminar 6	
13		Equations of a plane and a straight line in space	
14		Seminar 7	
15		Two-order curves and surfaces Seminar 8	

Recommended Sources

TEXTBOOK(S)

1. Howard Anton, Chris Rohres. Elementary linear algebra. 7-th edition, John Wiley& Sons, INC.
2. Demidovich V.P., Kudryavtsev V. A. Short course of advanced mathematics. M.: "Nauka", 2001.
3. Ilyin V. A., Kurkina A. B. Higher mathematics M.: 2005.
4. Ilyin V. A., Pozniak E. G. Linear algebra. M.: "Nauka", 1981.
5. Beklemishev D. B. Course of analytical geometry and linear algebra. M., "High School", 1998.
6. Alexander Akhmerov, Alexander Tyurin "Fundamental Higher Mathematics Linear Algebra and Analytical Geometry PI" Publisher: LAP LAMBERT Academic Publishing 2019. 264 pages

Assessment

Attendance	10%	At least 75% class attendance is compulsory
Presentation	10%	
Quiz	0%	
Seminars	30%	
Midterm Exam	0%	
Final Exam	50%	
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of WCU

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Western Caspian University General Student Discipline Regulations

ECTS allocated based on Student Workload	
Total Workload	90
Total Workload/30(h)	90/30
ECTS Credits of the Course	3