

Department of "Mechanics and Mathematics"

<b>Course Unit Title</b>	Probability Theory and Mathematical Statistics	
<b>Course Unit Code</b>	IF-BO5,	
<b>Type of Course Unit</b>	Compulsory	
<b>Level of Course Unit</b>	1 <sup>st</sup> year	
<b>National Credits</b>		
<b>Number of ECTS Credits Allocated</b>	3	
<b>Theoretical (hours/week)</b>	1	
<b>Practice (hours/week)</b>	1	
<b>Laboratory (hours/week)</b>		
<b>Year of Study</b>	1	
<b>Semester when the course unit is delivered</b>	2	
<b>Course Coordinator</b>	Amiraslanli Fatma Hikmet	
<b>Name of Lecturer(s)</b>	Amiraslanli Fatma Hikmet	
<b>Name of Assistant(s)</b>	-	
<b>Delivery Method</b>	Face to Face	
<b>Language of Instruction</b>	Azerbaijani, English	
<b>Prerequisites</b>	-	
<b>Recommended Optional Program Components</b>	-	
<b>Course description:</b>		
The "mathematical statistics" course, intended for undergraduate students, covers topics such as discrete and continuous random variables and their mathematical expectation, variance and mean squared tendency, initial and central moments, statistical distribution of sampling, frequency and relative frequency, initial and sample collection, evaluation of their numerical characteristics, confidence interval, and so on.		
<b>Course Objectives:</b>		
The goal of the course is to develop the mathematical thinking of future graduates, to instill in them the ability to conduct mathematical analysis of observations and results, and to make appropriate predictions.		
<b>Learning Outcomes</b>		
At the end of the course the student will be able to		Assessment
1	Developing students' intellectual potential and increasing their ability to use mathematical methods in their future activities.	1, 2
Assessment Methods: 1. Final Exam, 2. Presentation		
<b>Course's Contribution to the Program</b>		

		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	3
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		Random events and probabilities	
2		Seminar 1	
3		Basic properties of probability	
4		Seminar 2	
5		Distribution law of discrete random variables, distribution functions	
6		Seminar 3	
7		Discontinuous random variables. Numerical characteristics of random variables and their properties	
8		Seminar 4	

9		Law of large numbers	
10		Seminar 5	
11		Two-dimensional random variables	
12		Seminar 6	
13		Elements of mathematical statistics. Regression equations	
14		Seminar 7	
15		Functional interaction. Correlation coefficient and its calculation. Regression analysis	
		Seminar 8	

#### Recommended Sources

##### TEXTBOOK(S)

1. N.N. Bavrin "Theory of probability and mathematical statistics" Higher school, 2005
2. V.E. Gmurman. "Theory of probability and mathematical statistics" Higher school, 2003
3. V.E. Gmurman. "Guide to solving problems in probability theory of mathematical statistics" Higher school, 2004.
4. Robert W. Hogg, Joseph W. McKean, Allen T. Craig Introduction to Mathematical Statistics Eighth Edition. 2019, pp. 762.
5. Thomas J. Faulkenberry Psychological Statistics First published 2022by, New York, NY 10158. pp. 122.
6. William Mendenhall, Robert J. Beaver, Barbara M. Beaver Introduction to Probability and Statistics. 13th EDITION, 2009, pp. 777.
7. Dean Chalmers Series Editor: Julian Gilbey Cambridge International AS & A Level Mathematics: Probability & Statistics 1 Coursebook. Cambridge University Press. First published 2018, pp. 266.
8. Emelyanov, G. B. Task on the theory of probability and mathematical statistics: textbook / Г. Б. Emelyanov, V.P. Skitovich. — 3rd ed., ster. — Saint Petersburg: Lan, 2019. — 332 c.

#### 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

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