

Course Name : Probability and Statistics							
Course Code	Course Type	Regular Semester	Lecture (hours/week)	Seminar (hours/week)	Lab. (hours/week)	Credits	ECTS
CMP 227	B	Fall	3.00	0.00	1.00	3.50	5.00
<b>Lecturer</b> Artur Koci, PhD							
<b>Assistant</b> Gerti Veshi, Msc							
<b>Course language</b> Albanian							
<b>Course level</b> Bachelor							
<b>Description</b>		In the first part it is given in the following way axiomatic definition of probability, being a generalization of classical and statistical probability. A special place is occupied by variables e case, not only from the generalized way of giving them, but also from wide range of treatment. It is worth noting that the chapter on the laws of numbers medhenj and the central limit theorem. The second part contains a set of statistical methods used for evaluation of unknown parameters and for hypothesis control statistical. The mathematical argumentation of these methods is emphasized previously studied in detail the distribution of some election statistics. from on the other hand, in each of the described methods, the practical procedure is also given their implementation.					
<b>Objectives</b>		The aim of the course Probability and Statistics is to provide students with the necessary knowledge about the basic concepts of statistics and probability. In this course there is a combination of theoretical aspects with the practical aspect, increasing the ability of students for an efficient use of statistical analysis. The program is explained through units dealing with basic knowledge on: statistical data, density distribution, localization and variation indicators, variance, linear regression, correlation analysis, probability, etc.					
<b>Core Concepts</b>		Random events, Trial, Sample space, Probability density, Random variable, Normal distribution, Poissonian Mathematical Expectation, Dispersion Random sampling Histogram, Point assessment, interval assessment Statistical hypothesis.					
Course Outline							
Week	Topic						
1	PROBABILITY SPACE 1.1 Random events, 1.2 Actions with events, 1.3 Properties of actions with events,						
2	PROBABILITY. CONDITIONAL PROBABILITY, 2.1 The classical definition of probability, 2.2 Statistical definition of probability, 2.3 General understanding of probability,						
3	3.1 Continuity of probability, 3.2 Discrete probability spaces, 3.3 Conditional probability, 3.4 Independent events, 3.5 Full probability and Bayes formula,						
4	RANDOM VARIABLES 4.1 Meaning of the random variable, 4.2 The distribution function of the random variable, 4.3 Discrete random variables, 4.4 Continuous random variables, 4.5 Functions of random variables, 4.5.1 Functions of discrete random variables, 4.5.2 Functions of continuous random variables,						
5	5.1 Independent random variables, 5.2 Operations with random variables,						
6	NUMERICAL CHARACTERISTICS OF RANDOM VARIABLES, 6.1 Mathematical expectation, 6.2 Properties of mathematical expectation, 6.3 Dispersion,						
7	SOME IMPORTANT DISTRIBUTIONS, 7.1 Binomial distribution, 7.1.1 Calculation of binomial probabilities, 7.2 Poissonian distribution, 7.3 Discrete uniform distribution, 7.4 Normal distribution						
8	Semi-Final Exam						

<b>9</b>	THE LAW OF LARGE NUMBERS. LIMIT THEOREMS, 9.1 Understanding large numbers, 9.2 Cebishov's inequality, 9.3 Laws of large numbers, 6.4 Central limit theorem,
<b>10</b>	CASE SELECTION, 10.1 General concepts, 10.2 Case selection, 10.3 Numerical characteristics of random selection, 10.4 Overall dispersion, within groups and between groups, 10.5 Histogram, 10.6 Distribution of Certain Statistics
<b>11</b>	STATISTICAL EVALUATION OF PARAMETERS. SPOT ASSESSMENT, 11.1 Spot assessment, 11.2 Point estimation of mathematical expectation, 11.3 Point estimation of dispersion, 11.4 Accurate assessment of the probability of an event, 11.5 Maximum continuity method,
<b>12</b>	INTERVAL EVALUATION OF PARAMETERS, 12.1 Interval evaluation of parameters, 105 12.2 Confidence interval for the mathematical expectation of a normal random variable, 12.3 Confidence interval for the dispersion of a normal random variable, 12.4 The confidence interval for the probability of an event,
<b>13</b>	13.1 Confidence interval for the difference of mathematical expectations of two independent normal random variables, 13.2 The confidence interval for the difference in the probabilities of two events, 13.3 Confidence interval for the ratio of dispersions of two random variables independent normals,
<b>14</b>	HYPOTHESIS TESTS 14.1 Statistical hypotheses, 14.2 Types of hypotheses
<b>15</b>	15.1 Hypothesis testing. The error of the first type and the second type, 15.2 Errors that occur during hypothesis testing, 15.3 Hypothesis control on the equation of the mathematical expectation of a variable normal case with a hypothetical value,
<b>16</b>	Final Exam
<b>Prerequisites</b>	The student must attend the course at a minimum rate of 75%.
<b>Literature</b>	<ul style="list-style-type: none"> <li>• PROBABILITETI DHE STATISTIKA MATEMATIKE (Ribotim) - LORENC EKONOMI , GJERGJI CAPOLLARI</li> <li>• USHTRIME TE PROBABILITETIT DHE TE STATISTIKES (Botim i dyte) - LORENC EKONOMI, GJERGJI CAPOLLARI</li> </ul>
<b>References</b>	<ul style="list-style-type: none"> <li>• Probability and Statistics for Engineering and the Sciences JAY DEVORE California Polytechnic State University, San Luis Obispo</li> </ul>
<b>Course Outcome</b>	
<b>1</b>	Students should know and apply basic probability concepts and key probability distributions
<b>2</b>	Students should acquire the skills to process and analyze statistical data using the correct methods of processing them
<b>3</b>	Students should acquire the skills to present and interpret statistical data
<b>4</b>	Students must calculate statistical indicators and parameters and know how to interpret them in order to solve different situations.

<b>Course Evaluation</b>			
<b>In-term Studies</b>	<b>Quantity</b>	<b>Percentage</b>	
Midterms	1	40	
Quizzes	0	0	
Projects	0	0	
Term Projects	0	0	
Laboratory	0	0	
Class Participation	1	10	
<b>Total in-term evaluation percent</b>		<b>50</b>	
<b>Final exam percent</b>		<b>50</b>	
<b>Total</b>		<b>100</b>	
<b>ECTS Workload (Based on Student Workload)</b>			
<b>Activities</b>	<b>Quantity</b>	<b>Duration (hours)</b>	<b>Total (hours)</b>
Course duration (Including the exam week: 16x Total hours of the course)	16	4	64
Study hours outside the classroom (Preparation, Practice, etc.)	14	3	42
Duties	0	0	0
Midterms	1	8	8
Final Exam	1	11	11
Other	0	0	0
<b>Total Work Load</b>			<b>125</b>
<b>Total Work Load / 25 (hours)</b>			<b>5.00</b>
<b>ECTS</b>			<b>5.00</b>