Incoming student mobility

Name of UNIOS University Unit: SCHOOL OF APPLIED MATHEMATICS AND INFORMATICS

COURSES OFFERED IN FOREIGN LANGUAGE
FOR ERASMUS+ INDIVIDUAL INCOMING STUDENTS

Department or Chair within the UNIOS Unit	School of Applied Mathematics and Informatics

Study program	• Undergraduate university study programme in Mathematics

Study level	Undergraduate (Bachelor)

Course title	Introduction to Probability and Statistics
Course code	M098
Language of instruction	English
Brief course description	Syllabus. 1. Basic concepts of the probability theory (sample space, probability as a ratio, the frequency interpretation of probability, other examples of probability, the properties of probability, finite probability space, conditional probability and independence, law of total probability, Bayes' formula). 2. Random variables (discrete and continuous random variables, distribution of discrete random variable, distribution function of random variable, mathematical expectation (expected value) of random variable and its properties, other numerical characteristics of random variable and their applications (Markov's inequality, Chebyshev's inequality), the interpretation of numerical characteristics of a random variable). 3. Parametric families of random variables (Bernoulli, binomial, (Moivre-Laplace theorem - application, Poisson approximation - application), Poisson, geometric, normal, uniform, exponential). 4. Random vectors (two-dimensional discrete random vector, covariance and correlation, dependence and conditional distributions, independence of random variables, two-dimensional normal random vector, independent normal random variables, chi-square distribution, Student's t-distribution). Weak law of large numbers, central limit theorem.

	5. Descriptive statistics (data types, tabular and graphical data display, measures of central tendency, measures of dispersion, two-dimensional data, scatter diagram (scatterplot), the method of least squares, regression line). 6. Basic concepts of statistical inference (population and random sample, statistics, statistical model of a random sample from the Bernoulli population, the statistical model of random sample from normal population, simple linear regression, estimation of parameters in these models, confidence intervals for the parameters in these models, testing the hypothesis on parameter values in these models).
Form of teaching	Consultative teaching.
Form of assessment	Attending lectures and exercises is required. Exercises related to the descriptive statistics and basic statistical inference are performed using statistical software (e.g. Statistica, S+). Students' knowledge is continuously checked throughout the semester by means of mid-term exams and homework. After the completion of lectures and exercises students take the exam in written and oral form.
Number of ECTS	6
Class hours per week	2+2+0
Minimum number of students	
Period of realization	Winter semester
Lecturer	Ivan Papić