

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 and Computer Science
Study level	Undergraduate (Bachelor)
Course title	Applied Mathematics for Computer Science
Course code	M091
Language of instruction	English
Brief course description	<p>Syllabus.</p> <ol style="list-style-type: none"> 1. Introduction. Sums. Recurrences. Multiple Sums. Integer Functions. Floors and Ceilings. Applications of integer functions. 2. Number Theory. Divisibility. Euclidean Algorithm. Prime numbers and fundamental theorem of arithmetic. Congruencies. Chinese Remainder Theorem. Euler theorem. Application of congruencies. Quadratic Residues. Legendre and Jacobi symbols. 3. Combinatorics. The fundamental counting principles. Permutations and combinations of (multi)sets. Binomial and multinomial coefficients. Partitions of numbers and sets. Linear recurrences with constant coefficients. Systems of recurrences. Recurrence relations with two indices. Inclusion-exclusion principle. Generating functions. Applications of generating functions in solving recurrences. Special generating functions. Convolutions. Exponential generating functions. Special numbers. 4. Probability. Random experiment. Definition and examples of probability. Conditional probability (definition, independence of events, law of total probability). Discrete random variable (definition, distribution table, numeric characteristics and

	<p>interpretations, binomial distribution, Poisson distribution.) Continuous random variable (definition, density function, distribution function, numeric characteristics, normal distribution).</p> <p>5. Multivariable Calculus. Real multivariable functions. Space \mathbb{R}^n. Level curves and level surfaces. Limit and continuity. Partial derivatives and differentiability of multivariable functions. Gradient. Geometric interpretation: equation of tangential plane and normal on surface. Partial derivatives of higher order. Partial derivatives of implicit functions and compound. Directional derivative. Vector functions. Differentiability of vector multivariable function. Jacobi matrix. Differentials of higher order. Applications of differential calculus of multivariable functions: mean value theorems, extremes and conditional extremes. Multiple integrals. Double integral on rectangle: notion, properties, Fubini theorem. Double integral on general domains: definition, computation. Change of variables theorem, polar coordinates. Applications of double integral. Triple integral: computation, cylindrical and spherical coordinates, applications.</p>
Form of teaching	Consultative teaching.
Form of assessment	Lectures and exercises are obligatory. During the semester, students can take written examinations. Satisfactory scores on examinations can replace the final written examination. After lectures and exercises finish, student take final written and oral examinations.
Number of ECTS	9
Class hours per week	4+3+0
Minimum number of students	
Period of realization	Winter semester
Lecturer	Dragana Jankov Maširević Snježana Majstorović Ergotić Mirela Jukić Bokun