ERASMUS+
EU programme for education, training, youth and sport

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 • Undergraduate university study programme in Mathematics

Study level	Undergraduate (Bachelor)

Course title	Ordinary Differential Equations
Course code	M090
Language of instruction	English
Brief course description	Syllabus. 1. Introduction. Sources of ordinary differential equations (Problems of growth, radioactive decay, cooling problems, electrical networks, the predator / prey model, system of several masses and springs). Notion of solution, Cauchy problem. The slope field and geometric meaning. Classification of differential equations. 2. Ordinary differential equations of the first order. Existence and uniqueness theorems: Picard, Cauchy and Peano. Problem of sensibility on change of initial conditions. Introduction to numerical methods. Equation with separable variables, linear and exact equation. Solving some special types of equations (homogeneous, Bernoulli, Lagrange, Clairaut, Riccati, equations of higher order, which allow reduction of order). Applications. 3. Systems of ordinary differential equations and equations of higher order. Equivalence theorem. Existence and uniqueness result for Cauchy problem. 4. General results for linear equations and systems. Global solution. Fundamental system of solutions, matrix and determinant of Wronski. Evolution matrix of linear system. Lagrange's method of variation of constants. 5. Linear systems and equations with constant coefficients. Fundamental system of solutions and matrix exponential

	function. Method of undetermined coefficients. Laplace transform. Stability of the system. Applications. 6. Partial differential equation. Concept and examples from applications.
Form of teaching	Consultative teaching.
Form of assessment	Lectures and exercises are mandatory. The exam consists of a written and oral part and is taken after the completion of lectures and exercises. Acceptable scores achieved in mid-term exams taken throughout the semester replace the written part of examination.
Number of ECTS	6
Class hours per week	2+2+0
Minimum number of students	
Period of realization	Winter semester
Lecturer	Krešimir Burazin