

## Incoming student mobility

Name of UNIOS University Unit: DEPARTMENT OF MATHEMATICS

### COURSES OFFERED IN FOREIGN LANGUAGE FOR ERASMUS+ INDIVIDUAL INCOMING STUDENTS

Department or Chair within the UNIOS Unit	Department of Mathematics
Study program	<ul style="list-style-type: none"> <li>• <i>Undergraduate university study programme in Mathematics and Computer Science</i></li> <li>• <i>Undergraduate university study programme in Mathematics</i></li> </ul>
Study level	Undergraduate (Bachelor)
Course title	<b>Numerical Mathematics</b>
Course code	M089
Language of instruction	English
Brief course description	<p><b>Syllabus.</b></p> <ol style="list-style-type: none"> <li>1. Introduction. Error analysis. Significant digits. Floating point arithmetic. Error of the function. Inverse problem in error analysis.</li> <li>2. Interpolation. Spline interpolation. Interpolation problem. Lagrange form of the interpolation polynomial. Newton form of the interpolation polynomial. Error estimation. Linear spline interpolation. Cubic spline interpolation.</li> <li>3. Solving linear systems. Triangular systems. Gaussian elimination. LU - factorization - Cholesky-factorization. QR – factorization. Iterative methods. Singular value decomposition. Eigenvalue decomposition.</li> <li>4. Solving nonlinear equations. Bisection method. Method of simple iteration. Newton method and modifications. Solving systems of nonlinear equations: Newton method, quasi-Newton methods.</li> <li>5. Approximation of functions. Best polynomial. Best approximation. Orthogonal polynomial. Chebyshev's polynomial. Best approximation.</li> <li>6. Linear and nonlinear least squares problem</li> <li>7. Numerical integration. Trapezoidal rule. Newton-Cotes formula. Simpson rule.</li> </ol>

## ERASMUS+

EU programme for education, training, youth and sport

Form of teaching	Consultative teaching.
Form of assessment	Exercises are partially auditory and partially laboratory with computer use. Lectures and exercises are obligatory. The exam is taken after the completion of lectures and exercises, and it consists of a written and oral part. Acceptable results achieved in mid-term exams taken during the semester replace the written part of the exam. Students may influence their grade by doing extra-credit assignments or writing a seminar paper.
Number of ECTS	<b>6</b>
Class hours per week	<b>2+2+0</b>
Minimum number of students	
Period of realization	<b>Winter semester</b>
Lecturer	Kristian Sabo