

<b>STUDY MODULE DESCRIPTION FORM</b>			
Name of the module/subject <b>Method of Calculation</b>			Code <b>1010101141010110574</b>
Field of study <b>Civil Engineering First-cycle Studies</b>		Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>2 / 4</b>
Elective path/specialty <b>-</b>		Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>		Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>15</b> Classes: <b>-</b> Laboratory: <b>15</b> Project/seminars: <b>-</b>			No. of credits <b>2</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>	
Education areas and fields of science and art			ECTS distribution (number and %)
<b>Responsible for subject / lecturer:</b> dr hab. Albert Kubzdela email: albert.kubzdela@put.poznan.pl tel. 61 6652686 Faculty of Civil and Environmental Engineering ul. Piotrowo 5 60-965 Poznań		<b>Responsible for subject / lecturer:</b> dr Tomasz Garbowski email: tomasz.garbowski@put.poznan.pl tel. 61 6652099 Faculty of Civil and Environmental Engineering ul. Piotrowo 5 60-965 Poznań	
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>			
1	<b>Knowledge</b>	Basic knowledge on linear algebra, mathematical analysis and probability theory.	
2	<b>Skills</b>	Computer skills, familiarity with matrix calculus	
3	<b>Social competencies</b>	Feeling the need to raise their professional and personal competences, knowledge and skills. Ability to work in team.	
<b>Assumptions and objectives of the course:</b> Theoretical background and knowledge of numerical methods used in engineering practice. Develop programming skills, get basic experience in creating computing applications.			
<b>Study outcomes and reference to the educational results for a field of study</b>			
<b>Knowledge:</b>			
1. The student knows basic numerical methods, used in engineering practice - [K1_W01, K1_W11]			
2. The student knows the possible use of selected computer programs to realize specific numerical algorithms - [K1_W01, K1_W11]			
3. The student knows the basic ways to design numerical algorithms - [K1_W11]			
<b>Skills:</b>			
1. Student is able to choose proper computational model to solve specific engineering tasks - [K1_U03, K1_U05]			
2. Students can select the right algorithm needed to solve the numerical tasks - [K1_U03, K1_U05, K1_U06]			
3. Students can make a critical evaluation of the results of numerical analysis - [K1_U06]			
<b>Social competencies:</b>			
1. The student can work independently and in the team on the specific task - [K1_K01]			
2. Students can formulate conclusions - [K1_K02, K1_K09]			
<b>Assessment methods of study outcomes</b>			

<p>Lecture: check test knowledge through a written test,</p> <p>Laboratory: test the knowledge and skills by:</p> <p>a) assessment of student activity in the classroom,</p> <p>b) an assessment of the project tasks performed during the course during the semester (standalone, or in small teams) involving the preparation of a brief application executing indicated numerical algorithm,</p> <p>c) ending course test - working alone at the computer.</p>		
<b>Course description</b>		
<p>Computational methods of basic numerical tasks, in particular the</p> <ul style="list-style-type: none"> <li>- Solve systems of linear and nonlinear equations,</li> <li>- Problem solving interpolation and approximation, determine the regression model</li> <li>- Optimization tasks,</li> <li>- Numerical differentiation and integration,</li> <li>- The use of Monte Carlo methods.</li> </ul>		
<b>Basic bibliography:</b>		
<p>1. D. Kincaid, W. Cheney, Analiza Numeryczna, PWN, Warszawa 2006.</p> <p>2. Z. Fortuna, B. Macukow, J. Wąsowski, Metody numeryczne, WNT, Warszawa 2005.</p>		
<b>Additional bibliography:</b>		
<p>1. S. Rosłaniec, Wybrane metody numeryczne z przykładami zastosowań w zadaniach inżynierskich, Oficyna Wydawnicza Politechniki Warszawskiej, 2002.</p> <p>2. A. Bjorck, G. Dahlquist, Metody numeryczne, PWN, Warszawa 1983.</p> <p>3. A. Brozi, Scilab w przykładach, Nakom, Poznań 2007.</p>		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. participation in class	30	
2. consolidate the knowledge acquired in lectures	5	
3. preparation to the laboratory	10	
4. to prepare for the final test	10	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	55	2
Contact hours	30	1
Practical activities	25	1