STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Method of Calculation		**1010104151010110574**
Field of study	Profile of study (general academic, practical)	Year /Semester
Civil Engineering First-cycle Studies	**(brak)**	**3 / 5**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**obligatory**
Cycle of study:	Form of study (full-time,part-time)	
First-cycle studies	**part-time**	

No. of hours				No. of credits
Lecture: **10**	Classes: **-**	Laboratory: **10**	Project/seminars: **-**	**2**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)

Responsible for subject / lecturer:

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Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge on linear algebra, mathematical analysis and probability theory.
2	**Skills**	Computer skills, familiarity with matrix calculus
3	**Social competencies**	Feeling the need to raise their professional and personal competences, knowledge and skills. Ability to work in team.

Assumptions and objectives of the course:

Theoretical background and knowledge of numerical methods used in engineering practice. Develop programming skills, get basic experience in creating computing applications.

Study outcomes and reference to the educational results for a field of study

Knowledge:

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]

Skills:

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]

Social competencies:

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]

Assessment methods of study outcomes

Lecture: check test knowledge through a written test,

Laboratory: test the knowledge and skills by:

a) assessment of student activity in the classroom,

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,

c) ending course test - working alone at the computer.

Course description

Computational methods of basic numerical tasks, in particular the

- Solve systems of linear and nonlinear equations,
- Problem solving interpolation and approximation, determine the regression model
- Optimization tasks,
- Numerical differentiation and integration,
- The use of Monte Carlo methods.

Basic bibliography:

1. D. Kincaid, W. Cheney, Analiza Numeryczna, PWN, Warszawa 2006.
2. Z. Fortuna, B. Macukow, J. Wąsowski, Metody numeryczne, WNT, Warszawa 2005.

Additional bibliography:

1. S. Rosłaniec, Wybrane metody numeryczne z przykładami zastosowań w zadaniach inżynierskich, Oficyna Wydawnicza Politechniki Warszawskiej, 2002.
2. A. Bjorck, G. Dahlquist, Metody numeryczne, PWN, Warszawa 1983.
3. A. Brozi, Scilab w przykładach, Nakom, Poznań 2007.

Result of average student's workload

Activity	Time (working hours)
1. participation in class	20
2. consolidate the knowledge acquired in lectures	5
3. preparation to the laboratory	15
4. to prepare for the final test	15

Student's workload

Source of workload	hours	ECTS
Total workload	55	2
Contact hours	20	1
Practical activities	25	1