STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Computational methods**		Code **1010104151010120574**
Field of study **Civil Engineering First-cycle Studies**	Profile of study (general academic, practical) **(brak)**	Year /Semester **3 / 5**
Elective path/specialty **-**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **part-time**	

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

Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**	
Education areas and fields of science and art **technical sciences**		ECTS distribution (number and %**)** **2 100%**

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. Familiarity with programming, especially using scientific software package Scilab
2	**Skills**	Some experience in using of Linux operating system and programming using scientific software package Scilab
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 more 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:

Additional bibliography:

Result of average student's workload

Activity	Time (working hours)
1. participation in class	30
2. consolidate the knowledge acquired in lectures	5
3. preparation to the laboratory	15
4. to prepare for the final test	20

Student's workload

Source of workload	hours	ECTS
Total workload	70	2
Contact hours	30	1
Practical activities	40	1