STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Numerical methods**		Code **1010324341010340026**
Field of study **Electrical Engineering**	Profile of study (general academic, practical) **(brak)**	Year /Semester **2 / 4**
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 Lecture: **14** Classes: **-** Laboratory: **16** Project/seminars: **-**		No. of credits **4**
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		ECTS distribution (number and %)

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Student has knowledge of mathematics (in terms of linear algebra, calculus, ordinary differential equations) and computer science (the basic data structures and programming in high-level language).
2	**Skills**	Student can solve math analytically within the range specified above. Student can implement the algorithm in high-level programming language.
3	**Social competencies**	He understands the need to learn

Assumptions and objectives of the course:

Learning basic numerical methods and apply them to solve simple problems in the field of electrical engineering. Power engineering calculations relevant tools.

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

Knowledge:

1. He has knowledge of the approximate calculation methods useful to solve mathematical problems - [K_W02+++]
2. Knows the basic numerical methods applied to solving engineering - [K_U04+++, K_U13+++]
3. Know at least one computer package to assist solving technical issues - [K_W02+++, K_W11++, K_W21+]

Skills:

1. . Can select and use appropriate calculation method to solve the simple task of engineering - [K_U05++, K_U22+++]
2. Can use at least one commercial computer package for solving basic numerical methods - [K_U04+++, K_U13+++]
3. Student can carry out measurements and computer tests, interpret the results and draw conclusions - [K_K01+++]

Social competencies:

1. student is aware of the validity of the effects of engineering calculations - [K_K02+++, K_K03++]
2. student understands the need for learning - [K_K01+++]

Assessment methods of study outcomes

Lectures:

* Assess the knowledge and skills listed on the completion of the writing of a problematic (student may use any teaching materials),

* Control of perception during lectures.

Laboratory:

* Test and favoring knowledge necessary to perform the tasks of laboratory

* Continuous evaluation for each course - rewarding gain skills they met the principles and methods

* Assess the knowledge and skills associated with the implementation of the tasks your practice, the assessment report performed exercise.

Get extra points for the activity in the classroom, and in particular for:

* Propose to discuss further aspects of the subject;

* The effectiveness of the application of the knowledge gained during solving the given problem;

* Subsequent to the improvement of teaching materials;

* Developed aesthetic diligence reports and jobs - in the self-study.

Course description

Floating point arithmetic, the numerical errors.

Numerical stability and accuracy of task conditioning algorithms.

Numerical solution of nonlinear equations.

Function approximation.

Numerical integration and differentiation.

Numerical solution of ordinary differential equations of the first order with the initial condition - one-step methods.

The basic algorithms for numerical linear algebra problems.

Basic bibliography:

1. Magnucka-Blandzi, Metody numeryczne w MatLabie - Wybrane zagadniania. Wydawnictwo Politechniki Poznańskiej 2013

2. Kącki, Małolepszy, Romanowicz, Metody numeryczne dla inżynierów, Politechnika Łódzka 2000

3. Kincaid, Cheney, Analiza numeryczna, WNT 2005,

4. Fortuna, Macukow, Wąsowski, Metody numeryczne, WNT,

5. Burden, Faires ? Numerical analysis, Prindle, Weber&Schmidt, Boston,

Additional bibliography:

1. Björck, Dahlquist, Metody numeryczne, PWN Warszawa,

2. Marlewski, Podstawowe metody numeryczne dla studentów kierunków inżynierskich, ARTPRESS

Result of average student's workload

Activity	Time (working hours)

Student's workload

Source of workload	hours	ECTS
Total workload	80	4
Contact hours	40	2
Practical activities	35	2