



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Computational algorithms

### Course

Field of study

Electronics and Telecommunications

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/1

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

### Number of hours

Lecture

30

Laboratory classes

30

Other (e.g. online)

Tutorials

Projects/seminars

### Number of credit points

6

### Lecturers

Responsible for the course/lecturer:

dr hab. inż. Rafał Krenz

Responsible for the course/lecturer:

rafal.krenz@put.poznan.pl

61 6653912

### Prerequisites

Math, physics and programming on the secondary school level.

### Course objective

The course aims at providing basic information devoted to solving computational problems found in electronics and telecommunications, using algorithmic approach.

### Course-related learning outcomes

Knowledge

Knows and understands an algorithmic approach to solving basic computational problems and numerical procedures.

Knows Matlab scripting language and its applications in electrical engineering.

Knows basic numerical procedures used for linear equation set solving, integrating, differentiating, etc.



### Skills

Can apply algorithmic approach for problem solving.

Can use Matlab programming environment and the scripting language.

Is able to select best computational algorithm for a given problem.

### Social competences

Understands that computational algorithms are becoming more and more sophisticated, however, is aware of their limitations.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: final written exam, consisting of 5-7 problems to solve, 50% of the total number of points necessary to pass. Results are discussed individually with students.

Laboratory classes: continuous evaluation of tasks assigned by the teacher; final grade calculated as an average of all partial grades in the range 2-5 (D-A)

### Programme content

1. Introduction to algorithmic approach to problem solving:

algorithm representation, examples of simple algorithms

2. Elements of Matlab scripting language:

data types, operators, input/output, text and graphical representation of results,

loops, conditional expressions, matrix calculations, functions

3. Computational algorithms examples:

look-up tables, graphical representation of functions,

numerical integration, numerical differentiation,

iterative calculations, stop conditions,

root searching, min/max searching,

linear equation set solving,

curve fitting

statistical calculations



## Teaching methods

Lecture: multimedia presentation, practical examples in Matlab environment

Laboratory classes: exercises using PC and Matlab, problems assigned by the teacher

## Bibliography

Basic

MATLAB i Simulink : poradnik użytkownika / Bogumiła Mrozek, Zbigniew Mrozek

Algorytmizacja i programowanie w Matlabie / Kazimierz Banasiak

MATLAB : dla naukowców i inżynierów / Rudra Pratap

Additional

## Breakdown of average student's workload

	Hours	ECTS
Total workload	150	6,0
Classes requiring direct contact with the teacher	75	3,0
Student's own work (literature studies, preparation for laboratory classes, project preparation, preparation for the test) <sup>1</sup>	75	3,0

<sup>1</sup> delete or add other activities as appropriate