



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Introduction to programming in Matlab [S2EiT2E-TIT>MATLAB]

### Course

Field of study

Electronics and Telecommunications

Year/Semester

1/1

Area of study (specialization)

Information and Communication Technologies

Profile of study

general academic

Level of study

second-cycle

Course offered in

English

Form of study

full-time

Requirements

elective

### Number of hours

Lecture

30

Laboratory classes

30

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

5,00

### Coordinators

dr inż. Agnieszka Wardzińska

agnieszka.wardzinska@put.poznan.pl

dr inż. Sławomir Maćkowiak

slawomir.mackowiak@put.poznan.pl

### Lecturers

dr inż. Agnieszka Wardzińska

agnieszka.wardzinska@put.poznan.pl

### Prerequisites

Has a systematic knowledge of mathematical analysis, algebra and theory of probability. Has a systematic knowledge of computer architecture. Has a systematic knowledge of microcontroller, microprocessor and microprocessor system architecture and programming in assembly language, and architecture and programming of specialized processors. Has a systematic knowledge of operating systems and data bases. Has the knowledge of computer resource management and protection technologies. Is able to extract information from Polish or English language literature, databases and other sources. Is able to synthesize gathered information, draw conclusions, and justify opinions. Is able to communicate in English or in Polish in the professional environment and other environments. Is capable of studying autonomously. Is aware of the limitations of his/her current knowledge and skills; is committed to further self-study. Demonstrates responsibility and professionalism in solving technical problems. Is able to participate in collaborative projects.

## Course objective

Learning the fundamentals of structured programming based on the examples in Matlab. Learning to organise numerical data in data structures, to control the flow of a program, and to express a solution in a form of a structured algorithm. Learning the fundamentals of computational optimizations.

## Course-related learning outcomes

Knowledge:

Knowing the rules of construction of computer programs. Knowing the syntax and programming practices of Matlab environment

Skills:

Is able to analyze the operation of multimedia systems. Is able to solve problems related to multimedia systems, also problems including a research component.

Can implement in software basic computational algorithms using Matlab programming language

Social competences:

Knows the limits of own knowledge and skills, understands the need for ongoing education

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Individual reports from lab exercises

Written exam or oral exam

## Programme content

Introduction to the Matlab environment. The principles of vectorised programming in Matlab language.

## Course topics

Introduction to the Matlab environment. The principles of vectorised computations and linear algebra notation in Matlab. Data structures, vectors, matrices, sparse data, and their representations. Direct, indirect, relative and logical indexing. Advanced data manipulation. Basic statements, loops and conditional branches. Functional programming. Recursion. Implementation of basic 1D and 2D signal processing: filtering, transforms, quantization, basic pattern analysis.

## Teaching methods

Traditional lecture

Laboratory - in the early phase of the discussion, then individual / or group work method implementation of the project.

## Bibliography

Basic

Additional

1. S.J. Chapman, MATLAB Programming for Engineers, Cengage Learning, 2007

2. H. Moore, MATLAB for Engineers (Esource/Introductory Engineering and Computing), Prentice Hall, 2011

3. T. Dutoit, F. Marques, Applied Signal Processing: A MATLAB-based Proof of Concept, Springer 2009

## Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,00
Classes requiring direct contact with the teacher	70	3,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	55	2,00