



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

IT techniques

### Course

Field of study

Year/Semester

Transport

3/5

Area of study (specialization)

Profile of study

general academic

Level of study

Course offered in

First-cycle studies

Polish

Form of study

Requirements

part-time

compulsory

### Number of hours

Lecture

Laboratory classes

Other (e.g. online)

9

9

Tutorials

Projects/seminars

### Number of credit points

3

### Lecturers

Responsible for the course/lecturer:

Responsible for the course/lecturer:

dr hab. inż. Rafał Urbaniak

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Wydział Inżynierii Środowiska i Energetyki

ul. Piotrowo 3 60-965 Poznań

### Prerequisites

The student is able to effectively use basic office software and elements of modern computer systems.

### Course objective

The aim of the course is to provide students with information on software for scientific and technical calculations MATLAB, ANSYS, LABVIEW. Students gain knowledge and skills related to the design of IT measurement, control and analysis systems based on basic electronic and IT systems.

### Course-related learning outcomes

Knowledge

The student has extended and in-depth knowledge of physics useful for formulating and solving selected technical tasks, in particular for correct modeling of real problems



The student has ordered and theoretically founded general knowledge in the field of key issues of technology and detailed knowledge in the field of selected issues in this discipline of transport engineering

The student has knowledge of important development trends and the most important technical achievements and of other related scientific disciplines, in particular transport engineering

#### Skills

The student is able to obtain information from various sources, including literature and databases (both in Polish and in English), integrate it properly, interpret it and critically evaluate it, draw conclusions, and comprehensively justify his/her opinion.

The student is able - in accordance with the given specification - to design (create a model of a fragment of reality), formulate a functional specification in the form of use cases, formulate non-functional requirements for selected quality characteristics) and implement a device or a widely understood system in the field of means of transport, using appropriate methods, techniques and tools

The student is able to prepare and present, in Polish and English, a well-documented study of problems in the field of transport engineering, including oral presentations.

#### Social competences

The student understands that in technology, knowledge and skills very quickly become obsolete

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written exam

#### Programme content

ANSYS overview. Sample analysis of engineering problems for flow and heat transfer issues in ANSYS: static mixer, solid body flow, heat transfer in a finned tube. Overview of LABVIEW. Examples of solutions of control systems and measurement systems encountered in engineering practice using LABVIEW. MATLAB overview. Sample analysis of engineering problems in Matlab.

Characteristics of basic control and measurement systems. Characteristics of available methods of process control and available sensors and transducers.

#### Teaching methods

Lecture in the form of a presentation

Laboratory classes in the form of solving thematic problems

#### Bibliography



Basic

M. Piekarski., M. Poniewski - Dynamika i sterowanie procesami wymiany ciepła i masy, WTN, Warszawa, 1994

H. Orłowski - Komputerowe układy automatyki, WNT, Warszawa, 1987

R. Hagel, J. Zakrzewski - Miernictwo dynamiczne, WNT, Warszawa, 1984

Additional

Niederliński - Systemy komputerowe automatyki przemysłowej, t. 1 i 2, WNT, Warszawa, 1984

**Breakdown of average student's workload**

	Hours	ECTS
Total workload	68	3,0
Classes requiring direct contact with the teacher	18	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	50	2,0

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