



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Information Technologies [S1IMat1>TechInfo]

### Course

Field of study

Materials Engineering

Year/Semester

1/1

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

polish

Form of study

full-time

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

2,00

### Coordinators

dr inż. Radosław Wichniarek

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### Lecturers

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### Prerequisites

Student has knowledge of information technology and the basics of computer science in secondary school level. Student is familiar with computer hardware and system software and use basic applications like: word processing, spreadsheet, presentation graphics program. Student can use internet technologies for communication and information acquiring.

### Course objective

To familiarize students with the basic operations of computer hardware and software in the processes of data processing, transmitting, presenting and information security. Preparing students for the wide application of information technologies in engineering issues.

### Course-related learning outcomes

Knowledge:

student describes how information is represented in digital systems. student can describe functional

model of computer system, data processing organization and interface standards. student defines the basic structures of algorithms and methods for describing algorithms. student can describe the structure of computer networks, basic network services, computer network configuration and basic principles of data security in computer systems. [k\_w04]

#### Skills:

student can use system software to support hardware and data organization and utility software for computational tasks and presentation of results. can formalize simple algorithmic actions and describe them using visual basic. can automate activities in application software using visual basic for applications. [k\_u07, k\_u10]

#### Social competences:

student is open to the implementation of modern information technology in science and technology. student can use internet technologies for communication, teamwork and information search. student can acquire new knowledge on the subject. [k\_k01, k\_k04]

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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#### Forming rating:

- a) for the lectures: based on answers to questions concerning the material discussed in previous lectures ,
- b) for the laboratories: on the basis of an assessment of the current progress of tasks.

#### Summary rating:

- a) for the lectures verify the assumed effects of education is provided by assessment of knowledge and skills indicated in a written test which checks theoretical knowledge and its practical application. A pass requires 50% correct answers.
- b) for the laboratories verify the assumed effects of education is provided by prepare an assessment of the student"s individual laboratory classes and evaluation skills related to the implementation of laboratory exercises. Continuous assessment, for each class (oral answers). Assessment of practical skills during the tasks performed on the computer workstation.

### Programme content

#### Lecture:

1. Applying information technology in science and technology. Digital representation of information.
2. Functional and structural model of computer. Organization of data processing in digital systems.
3. System and utility software. Methods of description of algorithms. Correctness of the algorithm. Data structures, operations on data.
4. Basic numerical and graphical algorithms.
5. Customizing the application using Visual Basic for Applications.
6. Computer networks.
7. Security of data in computer systems.

#### Laboratory classes:

1. Using spreadsheets in computational and data presentation tasks.
2. Programming computational algorithms using Visual Basic.
3. Decision and iteration structures, written in Visual Basic.
4. Customizing the applications to specific needs using Visual Basic for Applications environment.

### Teaching methods

Lecture: multimedia presentation illustrated with practical examples, solving sample tasks by the lecturer. The lectures are suitable for online teaching.

Laboratory exercises: practical exercises, performing tasks at a computer station. Students can use their own computer equipment (including the knowledge and skills test). All laboratory exercises are suitable for online teaching.

### Bibliography

Basic

1. A. Hamrol (red.), Elementy informatyki dla inżynierów mechaników, Wydawnictwo Politechniki Poznańskiej, Poznań, 2001

2. M. Lewandowski, Więcej niż Excel 2007, Wydawnictwo Helion, Gliwice, 2010

Additional

1. T. Jankowski, Od podstaw VBA/ Excel, Wydawnictwo Mikom, Warszawa, 2004

2. T. Willis, B. Newsome, Visual Basic 2010. Od podstaw, Wydawnictwo Helion, Gliwice, 2011

### Breakdown of average student's workload

|   | Hours | ECTS |
|---|-------|------|
| Total workload  | 45    | 2,00 |
| Classes requiring direct contact with the teacher   | 30    | 1,00 |
| Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation) | 15    | 1,00 |