



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Introduction to engineering [N1ZiIP1>WDT]

### Course

Field of study

Management and Production 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

part-time

Requirements

compulsory

### Number of hours

Lecture

18

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

3,00

### Coordinators

dr hab. inż. Piotr Mikołajczak

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### Lecturers

dr hab. inż. Piotr Mikołajczak

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### Prerequisites

The student should recognize physical and chemical phenomena and the laws governing them within the scope of the high school program and also define units of physical quantities. The student should be able to associate phenomena occurring in nature with the laws of physics and chemistry. The student should show interest in the technique and willingness to deepen its knowledge.

### Course objective

Understanding the basic concepts related to technology, factors determining the development of technology, the development of selected branches of technology, operating principles and the use of basic types of selected groups of machines, the life cycle of technical objects.

### Course-related learning outcomes

Knowledge:

1. The student should define the basic concepts of technology and its development, characterize the factors conditioning this development and describe its effects - [K\_W08]
2. Classify energy and working machines and devices and describe their construction and operation - [K\_W08]

3. List and characterize the stages of the technical object's existence and their mutual relations - [K\_W20]

Skills:

1. The student should be able to analyze the causes, relationships and effects of phenomena occurring in the process of technical development - [K\_U04]
2. The student should choose machines according to their type and purpose - [K\_U10]
3. The student should describe the construction and operation of power and working machines - [K\_U08]

Social competences:

1. The student is aware of the need to provide information and opinions on the achievements of technology in a way that is widely understood by a wide public - [K\_K01]
2. The student is aware of the importance and understands issues related to environmental issues and restrictions related to natural resources. - [K\_K08]
3. Student understands the need for lifelong learning - [K\_08]

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Lecture

Written exam carried out at the end of the semester (credit if at least 50.1% of correct answers are obtained). Up to 50.0% - ndst (insufficient), from 50.1% to 60.0%? dst (sufficient), from 60.1% to 70.0% - dst + (sufficient +), from 70.1 to 80.0% Db (good), from 80.1% to 90.0% - db + (good +), from 90.1% - bdb (very good).

### Programme content

Science and knowledge, basic physical phenomena, mechanics, materials science, materials processing technologies, waste manufacturing techniques, design, machine design, machine science.

### Course topics

Science, knowledge, technology, engineer.

Basic physical phenomena used in technology.

Units of measurement. Normalization.

Basic concepts in technology.

Elements of mechanics and strength of materials.

Design and construction.

Materials science and heat treatment - metallic materials, ceramics, plastics, composites, heat treatment, etc.

Material processing technologies - foundry, plastic processing, plastic processing, additive techniques, material joining techniques.

Production technologies - machining, finishing, special machining.

Preparation of the technological process – definitions, documentation, machining bases, tolerances and fits, etc.

Basics of Machine Design PKM – fatigue strength, springs, shafts, bearings, clutches, gears.

Machine science - Hydromechanics, engines and water pumps, Properties of gases and vapors, combustion, boilers, Power plants and steam turbines, combustion engines, Compressors, refrigeration units, pneumatics.

Life cycle of a technical object: specification of requirements, design, including construction and design of the production process, production, operation, disposal and recycling.

Technology and factors stimulating its development.

Sustainable development.

### Teaching methods

Lecture: multimedia presentation illustrated with movies and examples shown on blackboard

### Bibliography

#### Basic

1. Edwin Tytyk, Marcin Butlewski, Wprowadzenie do techniki, Wyd. Politechniki Poznańskiej 2008
2. Red. Ryszard Grądzki, Wprowadzenie do techniki, Wyd. Politechniki Łódzkiej 2016

#### Additional

1. Multimedialna encyklopedia PWN, Technika
2. Orłowski B., Technika, Ossolineum Wrocław 1999
3. Kijewski J. I inni, Maszynoznawstwo, WSiP Warszawa
4. Legutko S., Podstawy eksploatacji maszyn i urządzeń, WSiP Warszawa
5. Grabski M. W., Kozubowski J. A., Inżynieria materiałowa, Oficyna Wyd. Politechniki Warszawskiej, Warszawa, 2003
6. Feld M., Projektowanie procesów technologicznych podstawowych części maszyn, WNT Warszawa, 2000.

#### Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	30	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	45	1,50