



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Introduction to Engineering [N1IZarz1>WdT]

### Course

Field of study

Engineering Management

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

14

Laboratory classes

0

Other

0

Tutorials

10

Projects/seminars

0

### Number of credit points

5,00

### Coordinators

dr hab. inż. Marcin Butlewski prof. PP  
marcin.butlewski@put.poznan.pl

### Lecturers

### Prerequisites

Knowledge of mathematics and physics in high school. Ability to solve simple problems in mathematics and physics. Group work, interest in technology.

### Course objective

To familiarize students with the basic problems associated with the development of technology, make aware of the logic of changes in manufacturing techniques and human relationships with technology and the environment. The systemic nature of these compounds is emphasized. Familiarizing students with modern trends in the development of technology and technology as well as the organization of human work aims to develop practical skills in identifying, understanding and describing contemporary techniques and technologies used in mechanical engineering).

### Course-related learning outcomes

Knowledge:

The student defines the life cycle of machines, including the stages of design, production, operation, and disposal [P6S\_WG\_14].

The student describes the life cycle of industrial products, covering stages from concept to market

withdrawal [P6S\_WG\_15].

The student names typical industrial technologies and characterizes their significance in the context of machine construction and operation [P6S\_WG\_17].

The student recognizes basic principles of safety and occupational hygiene in the machine-building industry [P6S\_WG\_18].

**Skills:**

The student plans and conducts a critical analysis of technological processes in machine production, considering aspects of efficiency and quality [P6S\_UW\_13].

The student identifies design tasks related to the construction and operation of machines and solves simple design problems in this field [P6S\_UW\_14].

**Social competences:**

The student is aware of the importance of non-technical aspects of engineering activities, including environmental impact and ethical aspects of technology [P6S\_KR\_01].

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

**Formative assessment:**

a) in the scope of exercises: ongoing checking of knowledge and skills during calculation and graphic exercises,

b) in the scope of lectures: based on a discussion of the material learned in previous lectures; bonus attendance at lectures.

**Summative rating:**

a) in the scope of exercises: based on the results of the average partial grades of the forming grade

b) in the scope of lectures: an exam in the form of a written test

## Programme content

Elements of the history of technology against the backdrop of human evolution and the development of societies. Techniques and technologies regarding materials (among others: plastic forming, casting, machining, heat treatment and thermo-chemical processes). Connections used in machine construction, principles of construction and functioning of machine components (bearings, gears, clutches, brakes). Techniques and technologies related to energy (sources, methods of transmission and transformation). Information techniques and technologies. Selected problems of modern technical civilization. Ethical problems of the user and the creator of the technique.

## Course topics

- Elements of the history of technology against the background of human evolution and the development of societies
- Techniques and technologies relating to materials (e.g. forming, casting, machining, heat and thermo-chemical treatment)
- Connections used in mechanical engineering
- Principles of construction and functioning of machine components (bearings, gears, couplings, brakes)
- Energy techniques and technology (sources, transmission and transformation)
- Information techniques and technologies
- Techniques and technologies in various fields of human activity
- Technology and human labour
- Selected problems of contemporary technical civilisation
- Ethical problems of the user and creator of technology
- History of inventions and their impact on the development of societies
- Development of technology in different historical periods
- Key figures in the history of technology and their achievements
- Impact of the Industrial Revolution on technology and society
- Technological innovations in the 20th and 21st century
- The impact of technology in shaping the modern world
- Interaction between technology and culture
- Sustainable development in a technological context

- Changes in production techniques and their impact on the labour market
- Automation and robotisation in industry
- The role of research and development in technological progress
- Challenges of technology in the context of globalisation
- Intellectual property protection in technology
- Technology and environmental protection
- Technological safety and its importance for society

## Teaching methods

Lectures with multimedia presentation

Accounting and designing exercises on topics related to lectures.

## Bibliography

Basic:

1. Wprowadzenie do techniki, Edwin Tytyk, Marcin Butlewski, Wyd. Politechniki Poznańskiej, Poznań, 2008
2. Wprowadzenie do techniki - materiały do ćwiczeń i wykładów, Zbigniew Tomaszewski, Wyd. Politechniki Poznańskiej, Poznań, 2002
3. Encyklopedia technik wytwarzania stosowanych w przemyśle maszynowym, Tom I, Jerzy Erbel (red.), Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2001
4. Encyklopedia technik wytwarzania stosowanych w przemyśle maszynowym, Tom II, Jerzy Erbel (red.), Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2001

Additional:

1. Technologia maszyn, Stefan Okoniewski, WSiP, Warszawa, 1999
2. Powszechna historia techniki, Bolesław Orłowski, Oficyna Wydawnicza Mówią Wieki, Warszawa, 2010
3. Dawne wynalazki, Peter James, Nick Thorpe, Świat Książki, Warszawa, 1997

## Breakdown of average student's workload

|                                                                                                                                         | Hours | ECTS |
|-----------------------------------------------------------------------------------------------------------------------------------------|-------|------|
| Total workload                                                                                                                          | 125   | 5,00 |
| Classes requiring direct contact with the teacher                                                                                       | 25    | 1,00 |
| Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation) | 100   | 4,00 |