



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Introduction to Engineering

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### Course

Field of study

Safety Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/1

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

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### Number of hours

Lecture

30

Laboratory classes

Other (e.g. online)

Tutorials

15

Projects/seminars

### Number of credit points

4

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### Lecturers

Responsible for the course/lecturer:

Ph.D., D.Sc., Eng. Marcin Butlewski , University  
Professor

Responsible for the course/lecturer:

Mail to: marcin.butlewski@put.poznan.pl

Phone: 61 665 33 77

Faculty of Engineering Management

ul. J. Rychlewskiego 2,60-965 Poznań



## Prerequisites

Knowledge of high school mathematics and physics.

Ability to solve simple tasks in the field of mathematics and physics.

## Course objective

Familiarizing students with the basic problems related to the development of technology, making them aware of the logic of changes in manufacturing techniques and the relationship between man and technology and the environment. The systemic nature of these relationships is emphasized. Acquainting students with modern trends in the development of techniques and technologies as well as the organization of human work is aimed at developing the practical ability to identify, understand and describe modern manufacturing techniques used in machine construction.

## Course-related learning outcomes

### Knowledge

He knows in depth the issues of technical safety, safety systems, occupational health and safety as well as threats and their effects. [K1\_W02]

Has in-depth knowledge of the life cycle of products, devices, facilities, systems and technical systems. [K1\_W06]

Has in-depth knowledge of quality engineering in relation to products and processes. [K1\_W07]

He knows the issues of management and organization as well as marketing and logistics in the context of security engineering. [K1\_W08]

He knows at an advanced level the methods, techniques, tools and materials used in preparation for conducting scientific research and solving simple engineering tasks with the use of information technology, information protection and computer support. [K1\_W11]

### Skills

Can properly select sources and information derived from them, perform the evaluation, critical analysis and synthesis of this information. [K1\_U01]

He can see system and non-technical aspects in engineering tasks, as well as socio-technical, organizational and economic aspects. [K1\_U03]

Can use analytical, simulation and experimental methods to formulate and solve engineering tasks, also with the use of information and communication methods and tools. [K1\_U04]

He can make a critical analysis of the way of functioning and assess, in connection with Safety Engineering, the existing technical solutions, in particular machines, devices, facilities, systems, processes and services. [K1\_U06]

Can design, using appropriate methods and techniques, an object, system or process that meets the requirements of safety engineering and make its initial economic assessment [K1\_U07]



Can identify changes in requirements, standards, regulations and technical progress and the reality of the labor market, and on their basis define the need for supplementing knowledge. [K1\_U12]

Social competences

Is aware of the recognition of the importance of knowledge in solving problems in the field of safety engineering and continuous improvement. [K1\_K02]

Is aware of the understanding of non-technical aspects and effects of engineering activities, including its impact on the environment and the related responsibility for decisions made. [K1\_K03]

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formative assessment:

a) in the field of exercises: current checking of knowledge and skills during accounting and graphic exercises,

b) in the field of lectures: on the basis of a discussion on the material assimilated at previous lectures;

Summative assessment:

a) in the field of exercises: on the basis of the results of the average of partial grades of the forming assessment

b) in the field of lectures: examination in the form of a written test.

### Programme content

Elements of the history of engineering with the background of human evolution and the development of societies. Techniques and technologies relating to materials (including metal working, casting, machining, heat and thermo-chemical treatment). Connections used in machine construction, principles of construction and operation of machine components (bearings, gears, clutches, brakes). Techniques and technologies relating to energy (sources, methods of transmission and transformation). Information techniques and technologies. Techniques and technologies in various fields of human activity. Technology and human work. Selected problems of contemporary technical civilization. Ethical problems of the user and the creator of the engineering.

### Teaching methods

Lectures with a multimedia presentation. Accounting and design exercises related to topics related to the lectures.

### Bibliography

Basic

1. Introduction to technology, Edwin Tytyk, Marcin Butlewski, Wyd. Poznań University of Technology, Poznań, 2008



2. Introduction to the technique - materials for exercises and lectures, Zbigniew Tomaszewski, Wyd. Poznań University of Technology, Poznań, 2002
3. Encyclopedia of manufacturing techniques used in the machinery industry, Volume I, Jerzy Erbel (ed.), Oficyna Wydawnicza Politechniki Warszawskiej, Warsaw, 2001
4. Encyclopedia of manufacturing techniques used in the machinery industry, Volume II, Jerzy Erbel (ed.), Oficyna Wydawnicza Politechniki Warszawskiej, Warsaw, 2001

#### Additional

1. Machine technology, Stefan Okoniewski, WSiP, Warsaw, 1999
2. The universal history of technology, Bolesław Orłowski, Oficyna Wydawnicza Talks Wieki, Warsaw, 2010
3. Ancient inventions, Peter James, Nick Thorpe, Świat Książki, Warsaw, 1997
4. Butlewski, M. (2012). The issue of product safety in contemporary design. Safety of the System, Technical, Organizational and Human Work Safety Determinants. Ed. Simon Salamon. Ed. PC freq. Częstochowa, 1428-1600.

#### Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (literature studies, preparation for classes-exercises, preparation for tests / examinations, making drawings) <sup>1</sup>	55	2,0

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