



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Materials technology and theory of chemical machines (Elements of machinery)

Course

Field of study

Chemical and process engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

Polish

Requirements

elective

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars

15

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

dr inż. Waldemar Szaferski

Responsible for the course/lecturer:

dr hab. inż. Marcin Janczarek

Prerequisites

Knowledge in the field of mathematics, physics and the basics of technical drawing and engineering graphics. Ability to read and understand technical drawings. Readiness to make decisions and cooperate within a specified team and be aware of the need of lifelong learning.

Course objective

The objective of the course is to familiarize with fittings occurring in the constructions of industrial apparatus and devices. Additionally, acquiring engineering skills in own designing of appropriate constructions for compensators of thermal elongation in pipelines.

Course-related learning outcomes

Knowledge

1. The student knows the basic concepts related to thermal expansion of pipes, corrosion resistance and pipe roughness properties, [K_W5, K_W13]
2. The student knows the types of thermal expansion compensators in pipelines and their application, [K_W5, K_W13]



3. The student knows the design process of appropriate constructions of expansion joints in the pipeline, [K_W15]

Skills

1. The student can choose the right type of construction material for process equipment, [K_U1, K_U14]
2. The student know how to choose a software to speed up the design process, [K_U6]
3. The student is able to design an appropriate construction of expansion joints for a particular pipeline, [K_U20]

Social competences

1. The student knows the limits of her/his own knowledge and understands the need for continuous education and development, [K_K1]
2. The student knows the advantages and disadvantages of team work and follows the rules accompanying these methods of solving the problems in industry, [K_K3]
3. The student can think and act in a creative and entrepreneur manner, [K_K5]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The skills acquired during the project classes are verified on the basis of the prepared, presented thematic presentation and a test (2 open tasks of a project nature).

If the classes will be held remotely, the forms of course assessments will remain unchanged and will be carried out with the use of tools provided by the Poznań University of Technology (<https://elearning.put.poznan.pl/>), about which students will be informed as soon as possible possible.

Programme content

The aim of the course is to get acquainted with the fittings used in the construction of industrial apparatus and devices. In addition, acquiring engineering skills related to the calculation of connections, couplings, gears and the independent implementation of the project with the use of appropriate design of expansion compensators in the pipeline.

Teaching methods

Multimedia presentation illustrated with examples given on the board, and completing tasks given by the teacher - practical exercises.

Bibliography

Basic

1. Potrykus J., Poradnik mechanika, REA, Warszawa 2008
2. Pikoń J., Podstawy konstrukcji aparatury chemicznej, cz. I i II, PWN, Warszawa 1979



3. Ryms M., Maszynoznawstwo chemiczne. Podstawy wytrzymałości i przykłady obliczeń. Wydawnictwo PWN, Warszawa 2017.
4. Pikoń J., Atlas konstrukcji aparatury chemicznej. Wydawnictwo PWN, Warszawa 1987.
5. Pikoń J., Aparatura chemiczna. Cz. . Dział Wydawnictw Politechniki Śląskiej, Gliwice 1974
6. Mechanika ogólna. T. 1, Statyka i kinematyka / Jan Misiak. Wydawnictwo WNT : PWN, 2016
7. Części maszyn / Andrzej Rutkowski. Wydawnictwa Szkolne i Pedagogiczne, 2005.
8. Współczesne badania wytrzymałościowe : kierunki i perspektywy rozwoju / Zbigniew L. Kowalewski., Warszawa: Biuro Gamma, 2008.

Additional

1. Marcolla K., Maszynoznawstwo, t. IV, Części maszyn, PWN, Warszawa 1972
2. Błasiński H., Młodziński B., Aparatura przemysłu chemicznego, WNT, Warszawa 1971

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	25	1,0
Student's own work (literature studies, preparation for classes, preparation for tests, project preparation) ¹	25	1,0

¹ delete or add other activities as appropriate