STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Material science and theory of machines in chemical technology – machinery elements	

Field of study	Profile of study (general academic, practical)	Year /Semester
Chemical Technology	**general academic**	**2 / 3**
Elective path/specialty	Subject offered in: **Polish**	Course (compulsory, elective) **elective**

Cycle of study:	Form of study (full-time,part-time)
First-cycle studies	**full-time**

No. of hours	No. of credits
Lecture: **-** Classes: **-** Laboratory: **-** Project/seminars: **15**	**2**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
other	**university-wide**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences **Technical sciences**	**2 100%**

Responsible for subject / lecturer:

dr inż. Waldemar Szaferski
e-mail: waldemar.szaferski@put.poznan.pl
tel. +48 61 665 3334
Faculty of Chemical Technology
ul. Berdychowo 4, 61-131 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Knowledge in the field of mathematics, physics and the basics of technical drawing and engineering graphics
2	**Skills**	Ability to read and understand technical drawings
3	**Social competencies**	Ability to make decisions and cooperate within a specified team and have awareness of the need for continuous development

Objectives of the course:

The objective of the course is to familiarize with fittings occurring in the constructions of industrial devices and equipment. Additionally, development of engineering skills in independent designing and application of compensators in pipelines.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Student knows the basic concepts related to thermal expansion of pipes, corrosion resistance and pipe roughness properties [K_W5, K_W13]
2. Student knows the types of thermal expansion compensators in pipelines and their application [K_W5, K_W13]
3. Student knows the design process of appropriate constructions of expansion joints in the pipeline [K_W15]

Skills:

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

Social competencies:

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

http://www.put.poznan.pl/

Assessment methods of study outcomes

Knowledge

Practical application of the acquired knowledge in the form of an individual project of applying appropriate expansion compensator designs in the pipeline. Applies to points 1-3.

Skills

Activity during classes and project. Applies to points 1-3.

Social competence

Presentation and defense of the project in the form of a multimedia presentation and activity during the classes. Applies to points 1-3.

Course description

As part of the course, practical strength calculations of elements of industrial fittings such as expansion joints related to temperature, pressure, vibrations in pipelines will be presented.

Basic bibliography:

1. Potrykus J., Poradnik mechanika, REA, Warszawa 2008
2. Wilczewski T., Pomoce projektowe z podstaw maszynoznawstwa chemicznego, Wydawnictwo Politechniki Gdańskiej, Gdańsk 2008
3. Lewandowski W.M., Ryms M., Maszynoznawstwo chemiczne podstawy wytrzymałości i przykłady obliczeń, PWN, Warszawa 2017
4. Katalog norm branżowych
5. Pikoń J.: Podstawy konstrukcji aparatury chemicznej, cz. I i II, PWN, Warszawa 1979

Additional bibliography:

1. Mały Poradnik Mechanika, t. I i II, WNT, Warszawa 1985
2. Błasiński H., Młodziński B.: Aparatura przemysłu chemicznego, WNT, Warszawa 1971
3. Lisowski A., Siemieniec A.: Wytrzymałość materiałów -przykłady obliczeń - zadania, PWN, Warszawa - Kraków 1976
4. Marcolla k.: Maszynoznawstwo, t. IV, Części maszyn, PWN, Warszawa - Poznań 1972
5. Mrowiec A., Mrowiec M.: Maszynoznawstwo i technika cieplna, t. II, cz. II, Podstawy wytrzymałości materiałów, Kraków 1974
6. Dobrzański T.: Rysunek techniczny maszynowy, WNT, Warszawa, wyd. 24.

Result of average student's workload

Activity	Time (working hours)
Preparation of the project	**20**
Preparation of the presentation	**10**

Student's workload

Source of workload	hours	ECTS
Total workload	50	2
Contact hours	25	1
Practical activities	25	1

http://www.put.poznan.pl/