COURSE DESCRIPTION CARD - SYLLABUS

Course name
Material Science and Theory of Machines - Liquid Container Project

Course

Field of study
Pharmaceutical Engineering

Year/Semester
2/3

Area of study (specialization)
-

Profile of study
general academic

Level of study
First-cycle studies

Course offered in
polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
0

Laboratory classes
0

Other (e.g. online)
0

Tutorials
0

Projects/seminars
15

Number of credit points

1

Lecturers

Responsible for the course/lecturer:
dr inż. Waldemar Szaferski

Responsible for the course/lecturer:

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 goal of the course is to acquire the knowledge about strength properties of construction materials used in the assembly of process apparatus. Acquiring engineering skills for independent design of a vertical tank used for tank of liquid mixtures in technological installations of the pharmaceutical industry.

Course-related learning outcomes

Knowledge

1. The student knows the basic elements of machines included in the installation of the apparatus of the pharmaceutical industry, [K_W4, K_W13]

2. The student knows the criteria for selecting construction materials for elements of the pharmaceutical industry apparatus, [K_W4, K_W13]

3. The student knows the effects of the apparatus operating conditions on their strength in the assumed working time, [K_W14, K_W15]

4. The student knows the design process of the pressure vessel and other basic devices. [K_W14, K_W15]

Skills

1. The student can choose the right type of construction material in the design process of the apparatus used in the pharmaceutical industry, [K_U1, K_U2]

2. The student can properly choose a computer program to accelerate the design process, [K_U5, K_U7]

3. The student can design basic devices (storage and pressure tanks) of the pharmaceutical industry. [K_U15, K_U27]

Social competences

1. The student is aware of the limitations of their own knowledge, and therefore the need for education and development, [K_K1, K_K3]

2. The student knows the pros and cons of teamwork and adheres to the principles accompanying such a way of solving problems in industry, [K_K1, K_K3]

3. The student can think and act in a creative and entrepreneurial way. [K_K1, K_K6]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Skills acquired as part of the project classes are verified on the basis of the individual project carried out and oral assessment of the submitted project, consisting of 3-5 open-ended questions related to the project. Passing threshold: 51% of points from oral answer and correctness of the prepared project.

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

As part of the classes, practical strength calculations of apparatus components such as supports and supporting structures affecting the safety of apparatus operation in the pharmaceutical industry will be presented. Design principles of vertical pressure tank for tank of liquid mixtures as the basic process laboratory apparatus and industrial installations of the pharmaceutical and related industries.

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. 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. Pikoń J.: Podstawy konstrukcji aparatury chemicznej, cz. I i II, PWN, Warszawa 1979

Additional

1. Bańkowski Z., Mały poradnik mechanika. T. 1, Nauki matematyczno-fizyczne, materiałoznawstwo. Wydawnictwa Naukowo-Techniczne, Warszawa 1996

2. Bańkowski Z., Mały poradnik mechanika. T. 2, Podstawy konstrukcji maszyn, maszynoznawstwo. Wydawnictwa Naukowo-Techniczne, Warszawa 1994

3. Lewandowski W., Melcer A., Zadania z maszynoznawstwa chemicznego. Wydawnictwo Politechniki Gdańskiej, Gdańsk 2011

4. Bielewicz E., Wytrzymałość materiałów. Wydawnictwo Politechniki Gdańskiej, Gdańsk 2013

Breakdown of average student's workload

	Hours	ECTS
Total workload	30	1,0
Classes requiring direct contact with the teacher	15	0,5
tudent's own work (literature studies, preparation for classes, project preparation) [1]	15	0,5

[1] delete or add other activities as appropriate