COURSE DESCRIPTION CARD - SYLLABUS

Course name
Projekt zbiornika gazu (Gas Tank Project)

Course

Field of study
Technologia chemiczna (Chemical Technology)

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
part-time

Requirements
elective

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars
10

Number of credit points

2

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 gas in technological installations of the pharmaceutical industry.

Course-related learning outcomes

Knowledge

1. Student knows the basic concepts in the field of strength of materials, [K_W13]

2. Student knows the basic concepts associated with the forces occurring in the construction of machines and equipment, [K_W13]

3. Student knows the basic elements of machines found in the process facility, [K_W12, K_W13]

4. Student knows the selection criteria of materials for the components of process equipment, [K_W12]

5. Student knows the effects of the equipment's working conditions on their strength in the assumed working time, [K_W4, K_W14]

6. Student knows the process of designing the pressure vessel, [K_W12]

Skills

1. Student can use the basic physical and chemical laws in the construction of industrial equipment, [K_U1, K_U5]

2. Student can describe and select machine elements and their joins, [K_U15]

3. Student can choose the right type of construction material for the designed process equipment, [K_U27, K_U7]

4. Student is able to assess the influence of the type of selected material on the working time of equipment in terms of corrosivity, [K_U8]

5. Student can design a pressure vessel which is the basic laboratory and industrial equipment in chemical facilities, [K_U31]

Social competences

1. Student knows the limits of her/his own knowledge and understands the need for continuous education and improving the professional skills, [K_K1]

2. Student knows the advantages and disadvantages of team work, [K_K3]

3. Student can think and act in a creative and entrepreneurial way, [K_K6]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Skills acquired in the project classes are verified on the basis of the preparation of individual project task and passing the classes in the form of oral verification of the submitted project, consisting of 3-5 open-ended questions related to the project. Passing threshold: 51% of points from oral answer and the correctness of prepared project task.

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 gas storage 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

5. Biernat J., Materiałoznawstwo. Wydawnictwo Politechniki Gdańskiej, Gdańsk 2016

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. Niezgodziński T., Wytrzymałość materiałów. Wydawnictwo Naukowe PWN, Warszawa 2010

4. Matczyński F., Mechanik : poradnik techniczny. T. 2. Cz. 2, Materiałoznawstwo. Państwowe Wydawnictwa Techniczne, Warszawa 1960

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

6. Niezgodziński M.E., Niezgodziński T., Wytrzymałość materiałów. Wydawnictwo Naukowe PWN, Warszawa 2010

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

8. Zielnica J., Wytrzymałość materiałów. Wydawnictwo Politechniki Poznańskiej, Poznań 2001

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	11	0,5
Student's own work (literature studies, preparation for exam, project preparation, preparation for design clasess) [1]	39	1,5

[1] delete or add other activities as appropriate