COURSE DESCRIPTION CARD - SYLLABUS

Course name
Projekt mieszalnika mechanicznego (Design of stirred vessel)

Course

Field of study
Technologia chemiczna (Chemical Technology)

Year/Semester
2/4

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
15

Number of credit points

2

Lecturers

Responsible for the course/lecturer:
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Responsible for the course/lecturer:

Prerequisites

Basics math, physics and chemistry; principles of engineering drawing; ability to use CAD software; ability to use calculation software; familiarity with the moodle.put.poznan.pl service; ability to create engineering design documentation; The student is aware of the advantages and limitations of individual and group work in solving the problems of an industrial nature and design; The student knows the limits of his knowledge and sees the need to deepen their knowledge.

Course objective

Students acquire the skills of designing apparatus (on the example of a mixer project) with the instrumentation selected on the basis of currently applicable standards and UDT.

Course-related learning outcomes

Knowledge

1.The student knows basic types of apparatus and machines used in chemical industry K_W04, K_W12; K_W14

2. The student knows graphic symbols of apparatus and machines used in technological schemes (according to PN EN ISO 10628 K_W04, K_W12; K_W14

3. The student knows methods and principles of designing selected chemical apparatus K_W04, K_W12; K_W14

Skills

1. The student is able to read technological diagrams of industrial installations K_U01, K_U02

2. The student is able to design mechanical mixer to produce selected two-phase system K_U03, K_U04

3. The student is able to solve calculation problems arising during design of chemical apparatus, K_U07, K_U15

4. The student is able to communicate knowledge in the form of papers, K_U27

Social competences

1. The student is aware and understands the aspects of practical application of acquired knowledge and skills in the field of apparatus design, and the related responsibility K_K01, K_K02

2. The student is aware of the advantages and limitations of individual work K_K01, K_K02, K_K03

3. The student knows the limitations of his own knowledge and understands the need for continuous education, with particular emphasis on standards update K_K01, K_K02, K_K03

4. The student is able to work in a group. Understands problems of group work. K_K01, K_K02, K_K03

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The skills acquired in the project classes are verified in the form of a defense taking place in the last and penultimate classes. The final assessment is the sum of the sub-points for documentation (40 points) and project defense (60 points). The credit threshold is 50 pts.

Programme content

Principles of design of stirred vessel; calculation of physicochemical properties, minimal impeller speed; mixing power; calculation of engine power; calculation of shaft diameter; calculation the strength of the shaft; calculation of vessel support; selection of clutch and moto-reducers; application of inverters; calculation of drop diameter and interfacial area; discharge time.

Teaching methods

Multimedia presentation, presentation illustrated with examples on the table, and resolving tasks provided by the lecturer.

Bibliography

Basic

1. Aparatura chemiczna, Pikoń J., Państwowe Wydawnictwa Naukowe, Warszawa, 1983

2. Mieszanie i mieszalniki, Stręk F., WNT, Warszawa, 1981

3. Mieszanie układów wielofazowych, Kamiński J., WNT Warszawa 2004

4. Pomoce projektowe z podstaw maszynoznawstwa chemicznego, Wilczewski T., Wydawnictwo Politechniki Gdańskiej, Gdańsk, 2008.

Additional

1. Aparatura chemiczna i procesowa, Warych J., Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2004

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	16	0,5
Student's own work (literature studies, preparation fo classes, preparation for defence/exam, project preparation) [1]	34	1,5

[1] delete or add other activities as appropriate