COURSE DESCRIPTION CARD - SYLLABUS

Course name
Process equipment - design of sedimentation tank [S1IChiP1>APpo]

Course

Field of study
Chemical and Process Engineering

Year/Semester
2/4

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

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

1,00

Coordinators

dr hab. inż. Szymon Woziwodzki prof. PP
szymon.woziwodzki@put.poznan.pl

Lecturers

Prerequisites

basics math, physics and chemistry; principles of creation of design documentation; basis of materials science and mechanical engineering; principles of technical drawing; construction of equipment for momentum exchange processes; ability to use CAD software (AutoCAD); ability to use calculation software; ability to create a design documentation; ability to obtain information from international standards and catalogues and databases; A student is aware of the advantages and limitations of individual and group work in solving the problems of an industrial nature and design; A student knows the limits of his knowledge and sees the need to deepen their knowledge

Course objective

The major objectives of the course are to obtain skills and knowledge about design of the sedimentation tank as well as training of ability to creation of flowsheets of process installations

Course-related learning outcomes

Knowledge:
1. a student knows construction of various sedimentation tanks - [k_w12]
2. a student knows optimization methods of sedimentation process - [k_w14]

3. a student knows methods and principles of design of sedimentation tanks [k_w14]
4. a student knows an effect of flocculants and coagulants on sedimentation [k_w14]

Skills:
1. a student knows how to design a basic installation for sedimentation process - [k_u06]
2. a student knows how to solve computational problems appearing during the design. - [k_u17]
3. a student knows how to select proper flocculants or coagulants- [k_u21]
4. a student can collect information from literature data and from catalogues [k_u21]
5. a student can create technological schemes od installations [k_u17]

Social competences:
1. a student has the awareness and understanding of aspects of the practical application of knowledge. - [k_k01]
2. a student knows the limits of his own knowledge and understands the need for continuing education. - [k_k02]
3. a student knows the limitation of work in groups. [k_k01, k_k02]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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 or in remote mode using eKursy system. The final assessment is the sum of the sub-points for documentation (40points) and project defense (60points). The credit threshold is 50 pts. For the remote defense mode, the student must turn on the camera and microphone.

Programme content

principles of construction of sedimentation tanks and installation; principles of sedimentation; selection of flocculants and coagulants; models of sedimentation; calculation of sedimentation area (settling velocity method); selection of pumps; calculation of drop pressure in pipelines; selection of pipelines fittings; creation of flow sheet diagrams.

Teaching methods

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

Bibliography

Basic
1. PN-EN ISO 10628 Schematy technologiczne instalacji przemysłowych. Zasady ogólne
2. J. Bandrowski, H. Merta, J. Zioło, Sedymentacja zawiesin. Zasady i projektowanie, Wydawnictwo Politechniki Śląskiej, Gliwice, 2001.
3. T. Malinowskaja, I.A. Kobrinskij, O.S. Kirsanow, W.W. Rejnfart, Rozdzielanie zawiesin w przemyśle chemicznym, WNT, Warszawa, 1986
Additional
1. Aparatura chemiczna, Pikoń J., Państwowe Wydawnictwa Naukowe, Warszawa, 1983
2. T. Wilczewski, Pomoce projektowe z podstaw maszynoznawstwa chemicznego, Wydawnictwo Politechniki Gdańskiej, Gdańsk 2008.
3. A. Heim, B. Kochanski, K.W. Pyć, E. Rzyski, Projektowanie aparatury chemicznej i procesowej, Wydawnictwo Politechniki Łódzkiej, Łódź 1993.

Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,00
Classes requiring direct contact with the teacher	15	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	10	0,50