STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Process Equipment - design of sedimentation tank	**1010701131010723470**

Field of study	Profile of study (general academic, practical)	Year /Semester
Chemical and Process Engineering	**general academic**	**2 / 4**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**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**	**1**

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	**1 100%**
Technical sciences	**1 100%**

Responsible for subject / lecturer:

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Responsible for subject / lecturer:

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	- 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
2	**Skills**	- 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
3	**Social competencies**	- 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

Assumptions and objectives of the course:

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

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

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 competencies:
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]**

Assessment methods of study outcomes
Knowledge:
Activity during the course: 1, 2, 4
Project defence; 2-3
Skills:
Exam project: 1, 3
Activity during the course: 2, 3
Social competencies:
Project defence: 1-3
Course description
During the course are discussed:
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.
Basic bibliography:
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 bibliography:
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.

Result of average student's workload	
Activity	**Time (working hours)**

1. Participation in lectures 2. Consultations 3. Making the project and Exam project	15 5 5

Student's workload		
Source of workload	**hours**	**ECTS**
Total workload	25	1
Contact hours	20	1
Practical activities	15	1