COURSE DESCRIPTION CARD - SYLLABUS

Course name
Process equipment - design of static mixer [S1IChiP1>APpms]

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

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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 and principles of design of stirred vessels; construction of momentum exchange equipment; ability to use CAD software (AutoCAD); ability to use calculation software; ability to create a digital design documentation; ability to obtain information from international standards and catalogues; 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 static mixers

Course-related learning outcomes

Knowledge:
1. a student knows construction of static mixers - [k_w12]
2. a student knows principles of mixing dynamics in static mixer [k_w14]
3. a student knows methods and principles of design of static mixers - [k_w15]

Skills:
1. a student knows how to select static mixer in various flow regimes - [k_u01]
2. a student knows how to estimate homogeneity degree in static mixer. - [k_u06]
3. a student knows how to calculate the pressure drop in static mixer - [k_u07]
4. a student knows how to calculate shear rate and shear stress in static mixer - [k_u19]
5. a student knows how to estimate an effect of physiochemical properties on mixing in static mixer [k_u21]

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_k04]
3. a student knows the limitation of work in group [k_k04]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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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 the remote mode using eKursy platform. 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 static mixers; pressure drop in static mixers; calculation of the drag coefficient for static mixers; calculation of the homogeneity degree in static mixers; length of static mixer; mixing of two-phase systems in static mixers

Teaching methods

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

Bibliography

Basic
1. F. Stręk, Mieszanie i mieszalniki, WNT, Warszawa 1981.
2. J. Kamieński, Mieszanie układów wielofazowych, WNT, Warszawa 2004.
3. E.L. Paul, V.A. Atiemo-Obeng, S.M. Kresta, Handbook of industrial mixing. Science and practice, Wiley&Sons, Hoboken 2004.
Additional
1. Pikoń J., Aparatura chemiczna, Państwowe Wydawnictwa Naukowe, Warszawa, 1983

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