



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Pharmaceutical industry equipment- design of cyclone [S1IFar2>APCpc]

Course

Field of study

Pharmaceutical 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

0

Tutorials

0

Projects/seminars

15

Number of credit points

1,00

Coordinators

dr hab. inż. Szymon Woziwodzki prof. PP
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Lecturers

Prerequisites

Basics of mathematical calculations, biology, physics and chemistry; rules for creating design documentation; basics of pharmaceutical material science and machinery; technical drawing rules; ability to use CAD software; ability to use spreadsheet software; ability to create electronic documentation; ability to obtain information from standards and catalogues of structural elements; The student is aware of the advantages and limitations of individual and group work when solving problems of an industrial and design nature; The student knows the limitations of her knowledge and sees the need to deepen it.

Course objective

Obtaining knowledge of the design of the centrifugal separator used for the separation and separation of pharmaceutical products

Course-related learning outcomes

Knowledge:

1. Student has basic knowledge of the calculation of centrifugal separators in the pharmaceutical industry and related industries [K_W18]
2. Student has knowledge of the construction of cyclones in the pharmaceutical industry [K_W18]

Skills:

1. Student can design a cyclone for the pharmaceutical industry [K_U17]
2. Student takes into account and applies legal regulations to standards applicable both in the industrial environment and in the field of research [K_U21]
3. In a professional and research environment, student can plan and organize individual and team work and work both individually and as a team [K_U25]

Social competences:

1. Student is ready to make decisions yourself and lead the team, critically assess the team's own activities and actions, take responsibility for the effects of these activities, and be able to cooperate and work in a group, inspire and integrate the professional environment. [K_K2]

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 in stationary or remote mode. The final assessment is the sum of the sub-points for documentation (40points) and leave the oral questions (60points). The payment threshold is 50 pts

Programme content

The program covers the following topics:

1. Principles of cyclone design.
2. Basics of cyclone construction.
3. Optimization of cyclone dimensions and operation.
4. Cost calculation.
5. Requirements for equipment in the pharmaceutical industry.

Course topics

The principles of cyclone design; design schedule; the basics of construction of cyclones; methods of designing cyclones; dedusting efficiency; gas pressure drop; selection, calculation and optimization of cyclone dimensions; cost calculation, requirements applicable to apparatus in the pharmaceutical industry.

Teaching methods

Multimedia presentation, presentation illustrated with examples on the board, and resolving tasks provided by the presenter; eKursy

Bibliography

Basic:

1. J. Warych, Procesy oczyszczania gazów. Problemy projektowo-obliczeniowe, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 1999.
2. J. Warych, Oczyszczanie przemysłowych gazów odlotowych, WNT, Warszawa 1994.
3. J. Warych, Aparatura chemiczna i procesowa, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2004.
4. Rozporządzenie Ministra Zdrowia z dnia 9 listopada 2015 roku w sprawie wymagań Dobrej Praktyki Wytwarzania

Additional:

1. Aparatura chemiczna, Pikoń J., Państwowe Wydawnictwa Naukowe, Warszawa, 1983
2. A. Heim, B. Kochanski, K.W. Pyć, E. Rzycki, Projektowanie aparatury chemicznej i procesowej, Wydawnictwo Politechniki Łódzkiej, Łódź 1993.

Breakdown of average student's workload

	Hours	ECTS
Total workload	30	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)	15	0,50