



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Pharmaceutical Industry Equipment

Course

Field of study

Pharmaceutical Engineering

Area of study (specialization)

-

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/4

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

30

Tutorials

0

Laboratory classes

0

Projects/seminars

0

Other (e.g. online)

0

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Szymon Woziwodzki

e-mail: szymon.woziwodzki@put.poznan.pl

tel. +48 61 6652147

Wydział Technologii Chemicznej

ul. Berdychowo 4, 61-131 Poznań

Responsible for the course/lecturer:

Prerequisites



basics of mathematical calculations, physics, biology and chemistry; rules for creating design documentation; basics of pharmaceutical and chemical materials science and machinery; ability to use spreadsheet software; ability to use CAD software; The student is aware of the advantages and limitations of individual and group work when solving problems of an industrial and design nature; student knows the limitations of their knowledge and sees the need to deepen it.

Course objective

Knowledge of equipment used in the pharmaceutical industry and related industries . The student acquires literacy and the creation of simple technological schemes of the pharmaceutical industry, as well as the basic calculations of selected process equipment of the pharmaceutical industry

Course-related learning outcomes

Knowledge

- 1.Student has basic knowledge of the construction of equipment and installations in the pharmaceutical and related industries [K_W18]
2. Student knows the rules for the selection of equipment used in the pharmaceutical, cosmetic and chemical industries [K_W16]

Skills

- 1.Student can choose the right equipment to solve simple and complex engineering tasks related to pharmaceutical engineering, it can analyse and assess the functioning of the basic equipment of the pharmaceutical industry [K_U16]
- 2.Student knows how to read and perform technical drawings and technological diagrams, he can use the selected computer program to create them [K_U18]

Social competences

- 1.Student is ready to critically assess his knowledge, understands the need to learn, complement directional knowledge and improve his professional, personal and social competences, understand the importance of knowledge in problem solving and is ready to consult experts. [K_K1]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired as part of the lecture is verified by the multiple choice test. The exam consists of 20-25 questions (test and closed), pass threshold: 50% of points. The accounting considerations on the basis of which questions are developed are communicated to students at the beginning of each subsequent lecture (for the subject of the previous).

Programme content

The lectures discuss the following operations: preparation of substrates, product separation and preparation, mass and heat exchange, chemical reactions and product formation.

Substrate preparation: impact mills, ball mills, jet mills, rotors, breakers and crushers, mechanical and static mixers



Product separation and preparation: deranged spacing machines, filters, filter presses, filter centrifuges, sedimentation centrifuges, distillation, distillers and distillation columns, rectification, rectification columns, extraction and extraction columns, evaporators and concentration of solutions, crystallizers, dryers and drying, freeze dryers.

Heat transfer: heat exchangers, shell, spiral, tubular, condensers and cooling apparatus

Mass exchange: mass exchangers, packed columns, tray columns, adsorption columns and adsorption

Chemical reactions: chemical reactors

Product molding: granulation and granulators, tablet presses and tableting, capsules

Teaching methods

multimedia presentation, illustrated with examples and films

Bibliography

Basic

1. J. Warych, Aparatura chemiczna i procesowa, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2004
2. H. Błasiński, B. Młodziński, Aparatura przemysłu chemicznego, WNT, Warszawa, 1983
3. Lewicki P. (pr.zbiorowa), Inżynieria procesowa i aparatura przemysłu spożywczego, WNT, Warszawa 2006.

Additional

1. Rozporządzenie Ministra Zdrowia z dnia 9 listopada 2015 roku w sprawie wymagań Dobrej Praktyki Wytwarzania

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	30	1,2
Student's own work (literature studies, preparation for exam) ¹	20	0,8

¹ delete or add other activities as appropriate