COURSE DESCRIPTION CARD - SYLLABUS

Course name
Methods of Technological Process Control

Course

Field of study
Pharmaceutical Engineering
Area of study (specialization)
-
Level of study
First-cycle studies
Form of study
full-time

Year/Semester
4/7
Profile of study
general academic
Course offered in
polish
Requirements
compulsory

Number of hours

Lecture
15
Laboratory classes
15
Other (e.g. online)
0
Tutorials
0
Projects/seminars
0

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
prof. dr hab. inż. Adam Voelkel

Responsible for the course/lecturer:

Prerequisites

Basic physical, inorganic, organic and analytical chemistry on academic level; knowledge of mathematical tools used in chemical calculations; Can use basic laboratory techniques of separation and cleaning of chemical compounds

Course objective

Presentation of process applications of chromatographic techniques. Newest achievements and

tendencies in process design. Basic of process chromatography dedicated to separation of biologically active substances.

Course-related learning outcomes

Knowledge

1. knowledge in the field of techniques, methods connected with the application of techniques in process chromatography - [K_W03,K_W11]

2. can describe methods, techniques, tools and materials used for the solution of simple problems connected with process chromatography - [K_W07, K_W13]

3. knowledge in the field of techniques, methods connected with the application of chromatographic techniques in process control - [K_W03,K_W11]

4. can describe methods, techniques, tools and materials used for the solution of simple problems connected with process control - [K_W07, K_W15]

Skills

Student can select the proper technique for process chromatography - [K_U01, K_U08, K_U09, K_U14]

2. Student can discuss chromatographic problems in English. - [K_U05, K_U06]

Social competences

1. Student understands the need to supplement her/his education and increasing professional competences. - [K_K01]

2. Student has the awareness to obey the engineer ethic rules. - [K_K02, K_K05]

3. Student can act and cooperate in the group accepting different roles. - [K_K03]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

written control work.

Permanent control before laboratory classes. Written reports from exercices.

Programme content

Process applications of chromatography as a tool of separation of biologically active substances. Engineering of chromatographic installation. Modeling of chromatographic proceses. Chromatography in biochemical industry. Chemical risk in technological process. Risk assessment in the technological systems. Process analysis – general rules of application of process analyzers. Economical aspects of process control. Collection and sample preparation systems for process analysis. Examples of application of chromatographic process analysis in the control of selection technological processes.

Teaching methods

lecture, laboratory classes

Bibliography

Basic

1. Podstawy chromatografii, Z.Witkiewicz, WNT, Warszawa, 2005.

2. Zastosowanie metod chromatograficznych, K. Bielicka-Daszkiewicz, K. Milczewska, A. Voelkel, Wyd. PP, Poznań, 2005, 2010.

3. Chromatografia procesowa, K. Kadlec, A. Voelkel, WPP, Poznań, 2011.

Additional

1. The essence of chromatography, C.F. Poole, Elsevier, Amsterdam, 2003.

2. Techniques and practice of chromatography, R.P.W.Scott, Marcel Dekker, Inc., Nowy Jork, 1995.

3. L. Mondello, Comprehensive Chromatography in Combination with Mass Spectrometry, Wiley, Singapur, 2011.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	40	1,6
Student's own work (literature studies, preparation for laboratory classes, preparation for tests) [1]	35	1,4

[1] delete or add other activities as appropriate