



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Elective subject II (Surface phenomena in nanotechnology, medicine and pharmacy)

Course

Field of study	Year/Semester
Chemical and process engineering	2/3
Area of study (specialization)	Profile of study
Bioprocess and biomaterials engineering	general academic
Level of study	Course offered in
Second-cycle studies	polish
Form of study	Requirements
full-time	elective

Number of hours

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

Number of credit points

1

Lecturers

Responsible for the course/lecturer:

Katarzyna Dopierała, PhD Eng.

Responsible for the course/lecturer:

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Faculty of Chemical Technology and Engineering

Institute of Chemical Technology and
Engineering

Berdychowo 4,

60-965 Poznań

Prerequisites

Basic knowledge in general, organic, inorganic and physical chemistry

Course objective

The aim of course is to gain the knowledge on reasons and effects of interfacial phenomena in engineering activity related to nanotechnology, medicine and pharmacy



Course-related learning outcomes

Knowledge

*K_W03 has widened and deepened knowledge in chemistry and related fields that enables formulating and solving complex tasks in chemical engineering (P7S_WG)

* K_W07 has knowledge on the newest chemical and material technologies, including technology of advanced materials and nanomaterials; knows current trends in development of chemical industrial processes (P7S_WG P7S_WK P7SI_WG)

* K_W12 has comprehensive and widened knowledge in the field of chosen area of study (P7S_WG P7S_WK)

Skills

* K_U11 has ability to adapt the knowledge from chemistry and related disciplines to solve technological problems and plan new industrial processes, not only chemical (P7S_UW P7SI_UW)

* K_U13 is able to critically analyze the industrial processes and implement modifications and improvement in this area, use the gained knowledge, including the knowledge on the newest achievements of science and technique (P7S_UW P7SI_UW)

* K_U14 has ability to evaluate the technological usefulness of resources and to select the technological process according to product quality demands (P7S_UW P7SI_UW)

Social competences

* K_K02 is aware of importance and understands the non-technical aspects and consequences of engineering activity, including its impact on the environment and the responsibility for the related decisions (P7S_KO)

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Writing assignment graded in the range 0-30 pts, where:

3,0: 16-18 pts

3,5: 19-21 pts

4,0: 22-24 pts

4,5: 25-27 pts

5,0: 28-30 pts

Programme content

The course is based on the following topics:

1. Physicochemistry of phenomena at interfaces



2. Interfacial phenomena in living organisms
3. Interfacial phenomena in medicine and pharmacy
4. Surface phenomena in bioprocesses
5. Surface phenomena in (nano)technology and bioengineering

Teaching methods

Lecture supported by multimedia presentation and group discussion

Bibliography

Basic

1. R. Zieliński, Surfaktanty. Budowa, właściwości, zastosowania, Wyd. 3, Wyd. Uniwersytetu Ekonomicznego w Poznaniu, Poznań 2017
2. G. M. Kontogeorgis, S. Kill, Introduction to Applied Colloid and Surface Chemistry, John Wiley& Sons, 2016
3. W. Norde, Colloids and Interfaces in Life Sciences and Bionanotechnology, CRC Press, 2011
4. M.J. Rosen, J. T. Kunjappu, Surfactants and Interfacial Phenomena, 4th Ed., Wiley, 2012
5. A.W. Adamson. Chemia fizyczna powierzchni, PWN, Warszawa 1963
6. L. Sobczyk, Kiszka „Chemia fizyczna dla przyrodników, PWN, 1977

Additional

1. H.-J. Butt , K. Graf, M. Kappl , Physics and Chemistry of Interfaces, Wiley 2003
2. C. E. Stauffer, Emulgatory, WNT, Warszawa 2001

Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,0
Classes requiring direct contact with the teacher	20	0,8
Student's own work (literature studies, preparation for tests/exam) ¹	5	0,2

¹ delete or add other activities as appropriate