



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Surface phenomena in technology, environmental protection and medicine

Course

Field of study

Year/Semester

Environmental Protection Technologies

I/2

Area of study (specialization)

Profile of study

Ecotechnology

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:

Responsible for the course/lecturer:

Katarzyna Dopierała, PhD Eng.

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Wydział Technologii Chemicznej

Instytut Technologii i Inżynierii Chemicznej

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Prerequisites

Basic knowledge in general chemistry, inorganic and organic chemistry as well as physical chemistry and basics of environmental protection and chemical technology

Course objective

The aim of course is to gain the knowledge related to causes and effects of interfacial phenomena in specific fields of human activity, especially in technology, medicine and environmental protection.



Course-related learning outcomes

Knowledge

* K_W03 has theoretically supported detailed knowledge in selected topics in the field of environmental protection (P7S_WG P7SI_WG)

*K_W11 has knowledge required to understand the problems of environmental hazards and methods of improving the safety level (P7S_WK)

*K_W13 has detailed knowledge on technological solutions in the field of environmental protection (P7S_WG P7SI_WG)

Skills

*K_U03 is able to selectively adapt the knowledge in the field of chemistry and related sciences to plan and solve research tasks in the field of technology for environmental protection (P7S_UW P7SI_UW)

* K_U10 can determine the priority in implementation of new approaches in environmental protection (P7S_UW P7SI_UW)

Social competences

* K_K03 is able to analyze and critically evaluate new areas in technologies for environmental protection, evaluate their innovation potential and technical feasibility (P7S_KK)

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 covers the following topics:

1. Introduction to interfacial phenomena
2. Surface phenomena in technology and nanotechnology
3. Surface phenomena in environmental protection
4. Monolayers and thin surface films



5. Surface wetting
6. Surface phenomena in living organisms and medicine
7. Surface phenomena in production of food, drugs and cosmetics

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

Additional

1. Z. Sarbak, B. Jachymska-Sarbak, A. Sarbak, Chemia w kosmetyce i kosmetologii, Wyd. MedPharm, Wrocław 2013
2. M. Molski, Chemia piękna, PWN, Wyd.2, Warszawa 2009

Breakdown of average student's workload

| | Hours | ECTS |
|---|-------|------|
| Total workload | 25 | 1,0 |
| Classes requiring direct contact with the teacher | 15 | 0,6 |
| Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹ | 10 | 0,4 |

¹ delete or add other activities as appropriate