COURSE DESCRIPTION CARD - SYLLABUS

Course name
Modeling of technological processes [S2TCh2-ES>MPT]

Course

Field of study
Chemical Technology

Year/Semester
1/2

Area of study (specialization)
Applied Electrochemistry

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
0

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
30

Number of credit points

2,00

Coordinators

dr inż. Paweł Jeżowski
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Lecturers

Prerequisites

The student should know the basic issues of mathematics, chemistry and physics in the field of chemical technology (some of the issues will be recalled during the design classes). The student should be able to pursue self-education. The student should understand the need for further self-learning and teaching other people (students).

Course objective

The aim of the project is to expand creativity and use the acquired knowledge in the field of chemical technology to implement a group project. During the course, the tutor introduces students to possible project topics and an example of a "step by step" project implementation. Topics can also be proposed by the student, but they must be consulted with the teacher. The possibility of using existing scientific works during the project implementation and the proper way of taking them into account during the project implementation will be discussed. Additionally, during the classes, there is time for discussing each project, as well as problems or doubts that may arise during its implementation. The condition for completing the project is its presentation and discussion about it.

Course-related learning outcomes

Knowledge:
1. Students has knowledge in the field of complex chemical processes, including the appropriate selection of materials, raw materials, methods, techniques, apparatus and devices for the implementation of chemical processes and the characterization of the obtained products - [K_W03]
2. Student has established and expanded knowledge of the selected specialization - [K_W11]

Skills:
1. Student has the ability to obtain and critically evaluate information from literature, databases and other sources, and to formulate opinions and reports on this basis - [K_U01]
2. Student has the ability to use the knowledge acquired as part of the specialization in professional activity - [K_U23]
3. Student can design a complex device, object, system or process in the field of technology and chemical engineering - [K_U24

Social competences:
1. Student is aware of the need for lifelong learning and professional development - [K_K01]
2. Student can think and act in an entrepreneurial manner - [K_K06]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formative evaluation: Consists of periodic evaluations of the progress of systematic work and project implementation, carried out periodically, in order to encourage students to consciously organize work. The subject is considered passed after obtaining a positive assessment of both the written work and the final presentation, and discussion after the presentation.
Summative assessment: Assessment of the periodic progress of written work, presentation, possibly taking into account active presence and active participation in classes.

Programme content

Topics including the practical application of knowledge of
chemical technology to design your own process bench.

Course topics

A short introduction on the history of electronics. Impact of atom structure, type of bonds and other parameters on electric current conduction. Semiconductor materials (with a discussion of obtaining silicon as one of the main semiconductor materials) and electronic components (diode types and their use, transistors their types and application). Processors, microprocessors, electronic circuits (integrated circuits), switching (logic) circuits. DC electric circuits. Electrical phenomena in the electrostatic and magnetic field. Ways to supply electronic circuits. AC electrical circuits. Power and electricity. Occupational health and safety in electrical engineering. Electrical measurement.

Teaching methods

Presentation, audio-visual aids

Bibliography

Basic:
Fundamentals of Electronics 1: Electronic Components and Elementary Functions
(ISBN: 9781786301819)
Fundamentals of Electronics 2: Continuous-time Signals and Systems
(ISBN: 9781119422082)
Fundamental Electrical and Electronic
(ISBN:9780750687379)
PrinciplesW. C. O'Mara, Handbook of Semiconductor Silicon Technology, Noyes Publications
(ISBN: 0815512376)

Additional:
Fundamentals of Electronics: Book 1: Electronic Devices and Circuit Applications (Synthesis Lectures on

Digital Circuits and Systems)
(ISBN: 9781627055628)

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	1,00