COURSE DESCRIPTION CARD - SYLLABUS

Course name
Designing of plastics processing [S2TCh2-TP>PPPTS]

Course

Field of study
Chemical Technology

Year/Semester
1/2

Area of study (specialization)
Polymer Technology

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

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Lecturers

Prerequisites

The student should have the necessary knowledge in the selection of construction materials used in the construction of chemical devices, apparatus and installations and knows the principles of their functioning. The student knows the necessary principles of operation of control and measurement systems and electronic control systems used in chemical technology. The student has knowledge in the field of technology and chemical engineering, machine science and apparatus of the chemical industry.

Course objective

Acquiring basic knowledge in the field of conceptual development and design of plastic products as well as technological research of plastic processing processes

Course-related learning outcomes

Knowledge:
1. The student has expanded and in-depth knowledge in the field of plastics processing necessary for modeling, planning, optimization and characterization of industrial technological processes. [K_W1, K_W11]
2. The student has knowledge in the field of processing, including the appropriate selection of polymer

materials, raw materials, methods, techniques, apparatus and equipment for their implementation and characterization of the products obtained. [K_W3]
3. The student has expanded knowledge in the field of investing in the plastics processing industry, management, including quality management, business operations and technology transfer. [K_W9]

Skills:
1. The student has the ability to obtain and critically evaluate information from literature, databases and other sources and formulate opinions and reports on plastics processing on this basis. [K_U1]
2. The student has the ability to communicate with specialists and non-specialists in the field of plastics processing and related fields. [K_U4]
3. The student has the ability to adapt knowledge in the field of plastics processing and related fields to solve problems in the field of processing and planning of new industrial processes. [K_U12]
4. The student is able to critically analyze the industrial processes of plastic processing and introduce modifications and improvements in this area, using the acquired knowledge, including knowledge about the latest achievements of science and technology. [K_U15]

Social competences:
1. The student is aware of the need for lifelong learning and professional development in the field of plastics processing. [K_K1]
2. The student is aware of the limitations of science and technology related to plastics processing, including environmental protection. [K_K2]
3. The student is able to think and act in a creative and entrepreneurial way. [K_K6]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Stationary/Online: Assessment of knowledge from project classes based on oral answers and paper. Evaluation of the final project.

Programme content

Issues in the field of conceptual development and design of plastic products as well as technological research of plastic processing processes

Course topics

Course contents include the following topics:
- polymer plastics processability indexes;
- basic principles of construction of plastic products;
- defining the shape and dimensions of the product - technical drawing;
- quality requirements for plastic products;
- assessment of the technological suitability of polymer raw materials in relation to the quality requirements imposed on them;
- selection of polymer material based on defined operating conditions and product functionality (mechanical calculations);
- selection of manufacturing technology along with the components of the technological line and peripheral devices (diagram of the technological center and the working tool);
- manufacturing technology - process parameters (optimization of set processing parameters), efficiency, etc.;
- economic and environmental aspects of plastics processing.

Teaching methods

1. Lecture: multimedia presentation, illustrated with examples on the board.
2. Papers in the form of a multimedia presentation.
3. Project: working with students in class (calculations, discussion, etc.)

Bibliography

Basic:
1. J. Ferguson, Z. Kembłowski: „Reologia stosowana płynów”, Łódź 1995.

2. K. Wilczyński: „Reologia w Przetwórstwie Tworzyw Sztucznych”, WNT W-wa 2001.
3. R. Sikora: „Przetwórstwo tworzyw wielkocząsteczkowych”, PWN W-wa 1987.
4. R. Sikora: „Podstawy przetwórstwa tworzyw polimerowych”, WPL Lublin 1992.
5. K. Wilczyński: „Przetwórstwo tworzyw sztucznych”, WPW W-wa 2000.
6. A. Smorawiński: „Technologia wtrysku”, WNT W-wa 1984.

Additional:
1. H. Saechtling: „Tworzywa sztuczne. Poradnik”, WNT Warszawa 2000.
2. W. Szlezyngier, „Podstawy reologii polimerów”, PRz. Rzeszów 1994.
3. R. Sikora i in., „Przetwórstwo tworzyw polimerowych. Podstawy logiczne, formalne i terminologiczne”, WPL Lublin 2006.

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