COURSE DESCRIPTION CARD - SYLLABUS

Course name
Plastic processing [S1ETI2>PTS]

Course

Field of study
Education in Technology and Informatics

Year/Semester
3/5

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
15

Laboratory classes
15

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

dr hab. inż. Monika Dobrzyńska-Mizera
monika.dobrzynska-mizera@put.poznan.pl

Lecturers

Prerequisites

Basic knowledge of physics, chemistry, and materials science. The ability to think logically, to use information obtained from the library and the Internet. Understanding the need to learn and acquire new knowledge.

Course objective

Acquisition of knowledge concerning various processing technologies and characterization methods of polymeric materials, as well as evaluation of the relationship between polymer structure and the properties of plastics.

Course-related learning outcomes

Knowledge:
1. The student should be able to describe the basic properties of ceramic materials.
2. The student should be able to describe the basic techniques for manufacturing ceramic materials.
3. The student should be able to describe the products obtained using a given technology

Skills:

1. The student is able to select the appropriate etching technology for a given product.
2. The student is able to propose an alternative manufacturing technique.
3. The student is able to carry out a basic manufacturing process.

Social Competencies:
1. The student is able to collaborate in a group.

Translated with DeepL.com (free version)

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:
The lecture course is assessed on the basis of a final test conducted at the end of the semester. The assessment consists of open-ended and/or multiple-choice questions covering the lecture content.

Laboratory classes:
Completion of the laboratory course requires obtaining a passing grade for each laboratory exercise. The final assessment is based on:

an oral or written assessment verifying preparation for the laboratory exercise,
performance of the laboratory task,
preparation and timely submission of laboratory reports in accordance with the instructor’s guidelines.

All laboratory exercises must be successfully completed in order to obtain credit. Assessment criteria and grading scale are consistent with the applicable Study Regulations.

Programme content

Key processes in plastics processing, such as injection molding, extrusion, laminating, vacuum and rotational forming, as well as coating application. Physical and chemical phenomena occurring during these processes. Analysis of the impact of technological parameters on the quality and properties of plastic products. Common product defects and methods of prevention. Comparison of the specifics of individual technologies and their practical applications in industry.

Course topics

Lecture:
Technological processes used in polymer processing, including injection molding, extrusion, lamination, vacuum thermoforming, 3D printing, and application of polymer coatings. Physical and technological phenomena occurring during processing operations. The influence of processing parameters on the structure and functional properties of plastic products. Typical defects of products manufactured using different polymer processing technologies, together with methods of their identification and prevention. Characteristics of individual processing technologies and their applications in industrial practice.

Laboratory classes:
Laboratory exercises involving polymer processing technologies, including injection molding, extrusion, lamination, thermoforming, 3D printing, and application of polymer coatings.

Teaching methods

Lecture:
Lectures conducted in the form of multimedia presentations supported by animations, practical examples, and discussion of selected technological problems.

Laboratory classes:
Laboratory classes involving the performance of experimental procedures and technological processes, analysis and interpretation of obtained results, and discussion of the course and outcomes of the experiments.

Bibliography

Basic
1. Bociąga E: Specjalne metody wtryskiwania tworzyw polimerowych, WNT, Warszawa 2010
2. Praca zbiorowa. Poradnik „Tworzywa sztuczne”, WNT, Warszawa 2006
3. Haponiuk J.T.; Tworzywa sztuczne w praktyce; Wyd. VerlagDashofer, Warszawa 2008
4. Frącz W., Krywult B.- Projektowanie i wytwarzanie elementów z tworzyw sztucznych, Oficyna wydawnicza Politechniki Rzeszowskiej, 2005
5. Sikora R.: Przetwórstwo tworzyw wielkocząsteczkowych, Wyd. Edukacyjne Żak, W-wa, 1993
Additional
1. Czasopisma: Plastics Review, RubberReview, Plast News, Tworzywa Sztuczne.
2. Charrier J-M.: Polymer Materials and Processing, Hanser Publishers, New York, 1990

Breakdown of average student's workload

	Hours	ECTS
Total workload	55	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)	25	1,00