



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Plastic processing [N1MiBM2>PTS]

### Course

Field of study

Mechanical Engineering

Year/Semester

3/6

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

part-time

Requirements

compulsory

### Number of hours

Lecture

16

Laboratory classes

16

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

4,00

### Coordinators

### Lecturers

### Prerequisites

Knowledge of basic physical and chemical aspects of processing of polymers.

### Course objective

Learning the basics of the physical and physicochemical processes occurring during the processing of polymeric materials and analyzing the factors affecting the processability of product construction

### Course-related learning outcomes

Knowledge:

1. The student has detailed knowledge of the division and classification of polymeric materials.
2. The student knows the basics of manufacturing plastic products.

Skills:

1. The student has the ability to distinguish between modern manufacturing technologies.
2. The student has knowledge of systems for simulation of technological processes.
3. Is able to cooperate with other people as part of team work (also of an interdisciplinary nature)

Social competences:

1. The student is aware of the importance of processing in the economy and social life.

2. The student demonstrates an active attitude in creating manufacturing processes.
3. The student is able to assess the quality of plastic product manufacturing processes.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Credit on the basis of the test carried out at the end of the semester, containing general or test questions, credit if 51% of points are obtained.

### Programme content

#### Laboratory

Phenomena occurring during various plastics processing processes. The influence of technological parameters of processing processes on the properties of manufactured plastic products. Typical defects of plastic products made using various technologies and ways to prevent them.

1. Injection technology.
2. Extrusion technology.
3. Pressing technology
4. Technology of pressing composite panels.
5. Lamination technology I.
6. Laminating technology II.
7. Negative vacuum thermoforming.
8. Positive vacuum thermoforming.
9. Welding of plastics.
10. Welding and gluing plastics.
11. Applying polymer coatings to metal products.
13. Casting silicone rubbers.
13. Processing of polyvinyl chloride pastes.

#### Lecture

Discussion of the specificity of individual processes and their possible applications in industrial practice

1. Technological properties of polymer materials.
2. Preparation of raw materials for processing, drying, granulating, mixing.
3. Injection technology, construction of the injection molding machine and injection molds, parameters.
4. Special plastic injection methods.
5. Extrusion of polymer materials, single- and double-screw plasticizing systems.
6. Lamination technology, raw materials, forms, lamination methods.
7. Thermoforming technology (vacuum forming).
11. Technologies for pressing polymer materials
12. Technology of pressing composite products
13. Composite materials and directions of development of modern plastics processing technologies.

### Course topics

none

### Teaching methods

lecture: multimedia presentation, illustrations, sample multimedia films of technological processes

laboratories: work with devices, production of pipe and laminate products,

### Bibliography

#### Basic:

R.Sikora - Przetwórstwo tworzyw wielkocząsteczkowych. Wyd. ZAK , Warszawa 1997.

H. Saechtling, Tworzywa sztuczne Poradnik, WNT, 2000.

W. Szlezzyngier, Z. K. Brzozowski, Fosze, Tworzywa sztuczne. Tom 1. Tworzywa ogólnego zastosowania , 2012.

#### Additional:

J.T Haponiuk: Tworzywa sztuczne w praktyce. Wyd. Verlag Dashofer, W-wa 2008r.

J. Rabek: Polimery i ich zastosowania interdyscyplinarne. Tom 1 i 2, PWN 2021

Czasopisma: Plastics Review, Rubber Review, Plast News, Tworzywa Sztuczne.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	32	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	68	2,50