



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Polymer processing II [S1IMat1>PTSII]

### Course

Field of study

Materials Engineering

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

compulsory

### Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

2,00

### Coordinators

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### Lecturers

### Prerequisites

Basic knowledge of materials science of polymer materials and basic methods of their processing.

### Course objective

Detailed knowledge of the processing methods of polymers and the selection of processing parameters.

### Course-related learning outcomes

Knowledge:

1. student should identify the effects of polymer melting and the phenomena describing the behavior of the melted polymers.
2. the student should characterize and propose, depending on the needs, the methods of processing plastics.

Skills:

1. student is able to choose a polymer material and an appropriate method of processing polymeric materials.
2. the student is able to suggest in detail the processing method and the type of shaping tool.
3. the student is able to define the conditions of polymer processing.

Social competences:

1. the student is aware of the importance of the use of plastics in the economy and social life.
2. the student is able to work in a group.
3. can think and act in an entrepreneurial way.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Lecture: Passed on the basis of a written exam consisting of 5 general questions (pass in the case of a correct answer to at least questions: <3 - ndst; 3 - dst; 3.5 - dst +; 4 - db; 4.5 - db +; 5 - very good) conducted at the end of the semester.

Laboratory exercises: Credit based on reports on laboratory exercises in accordance with the guidelines of the teacher.

### Programme content

Presentation of several more advanced plastics processing methods, especially free and non-free blowing technology, production of large-sized products and polymer composites processing technology.

### Course topics

Lecture:

1. Characteristic features of polymer plastics processing.
2. Characteristics of the production of polymer composites.
3. Methods for determining the conditions and parameters of injection moulding.
4. Production of multilayer and special films.
5. Rotational moulding technology.
6. Technologies for producing hollow products: injection and blow extrusion.
7. Technologies of plastics foaming.

Laboratory exercises :

1. Technology of injection of composite materials.
2. Injection technology with foaming.
3. Two-screw extrusion technology
4. Production of composite films with the use of chill-roll extraction
5. Production of polymer-wood composites
6. Rotational moulding technology.
7. Extrusion blow moulding technology.

### Teaching methods

Lecture: multimedia presentation illustrated with examples given on the board.

Laboratory exercises: Credit based on reports on laboratory exercises in accordance with the guidelines of the teacher.

### Bibliography

Basic:

1. Bociąga E. ,Specjalne metody wtryskiwania tworzyw polimerowych, WNT, W-wa 2008 .
2. Kucharczyk W., Żurowski W., Przetwórstwo tworzyw sztucznych dla mechaników, Radom, Wydawnictwo Politechniki Radomskiej, 2005

Additional:

1. Czasopisma: Przegląd Odlewnictwa, Plastics Review, Rubber Review, Plast News, Tworzywa Sztuczne, Przetwórstwo Tworzyw.
2. Sikora R., Przetwórstwo tworzyw wielkocząsteczkowych, Wyd. Pol. Lubelskiej 2006

3. Smorawiński A., Technologia wtrysku, WNT, Warszawa 1989.
4. Śledziona J., Podstawy technologii kompozytów, Wyd. Politechniki Śląskiej, 1998
5. Koszkuł J., Materiały polimerowe, Wyd. Politechniki Częstochowskiej, 1999

#### Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	40	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	35	1,50