



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Polymer Processing Systems

Course

Field of study

Material Engineering

Area of study (specialization)

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

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Faculty of Mechanical Engineering

Piotrowo 3 st., 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Student should have a basic knowledge of materials science and processing technologies of polymer materials.

Course objective

Student should obtain knowledge about the roles in selection of tooling, parameters and processing methods, as well as the characteristics of the production lines necessary for the production of polymer plastic products.

Course-related learning outcomes

Knowledge



Student should distinguish between types of peripheral equipment used in the processing of polymer materials.

Student should formulate the most important recommendations regarding the processing parameters of polymeric materials and the criteria for selecting peripheral equipment.

Student should formulate the most important guidelines for the components of devices in production lines used in the processing of polymer materials.

Skills

Student is able to create the product by choosing the right technological process and tools.

Student is able to design a simple technological process including machine performance, raw material circulation and product control.

Student has the necessary skills to work in an industrial environment, knows the safety rules associated with the polymer processing process.

Social competences

Student is recognize the importance of using plastic products in the economy and social life.

Student is open to cooperation with other specialists (designers, quality control specialists).

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:

Written colloquium at the end of the semester, contains open questions of any kind of presented technologies (credit in case of obtaining at least 50,1% correct answers).

Laboratory classes:

Every single exercise should be passed by giving the written answer and additional final report on a training. All laboratory exercises must be passed with positive note.

Programme content

Lecture

1. Transportation of bulk materials for processing, mixing, feeding of pelletised plastics.
2. Injection molding machine selection in case of production volumen.
3. Injection molding machine supported by the 3 axis linear robot and other peripheral equipment.
4. Technologies applied in plastic part decoration.
5. Specification of extrusion lines for profile calibration.



6. Instructions of processing regulations and quality control in production lines.

Laboratory classes

1. Feeders used in plastics pellet transportation - calibration of working feeder.
2. Rotational molding technique.
3. Adjusting of 3 axis linear robot for displacement of the injection molding part.
4. Mounting of mold on injection machine and setting up the process parameters.
5. Profiles extrusion.
6. Extrusion blow molding of containers.

Teaching methods

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

Laboratory classes: demonstration of machine and equipment operation, performing experiments, solving tasks, discussion, teamwork.

Bibliography

Basic

1. A. Smorawinski, Technologia wtrysku, WNT 1982.
2. W. Frącz, Przetwórstwo tworzyw polimerowych, wyd. Politechnika Rzeszowska, Rzeszów 2011.
3. K. Wilczyński, Przetw. Tworzyw Sztucznych, wyd. Politechnika Warszawska, 2000.
4. J. Stasiak, Wytłaczanie, Wyd. Uniw. Techn.-Przyrodn., Bydgoszcz 2003.
5. A. Boczkowska i in.: Kompozyty, Oficyna Wydawnicza Politechniki Warszawskiej, 2000.
6. J. Garbarski, Materiały i kompozyty niemetalowe, Oficyna Wydawnicza Politechniki Warszawskiej, 2001.

Additional

1. Poradnik: Tworzywa Sztuczne, WNT, W-wa, 2000.
2. D. Żuchowska, Polimery Konstrukcyjne, WNT, Warszawa 2000.
3. W. Frącz, B. Krywult – Projektowanie i wytwarzanie elementów z tworzyw sztucznych, wyd. Politechnika Rzeszowska, 2005.



Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	35	1,5
Student's own work (literature studies, preparation for laboratory classes, preparation for colloquium) ¹	15	0,5

¹ delete or add other activities as appropriate