COURSE DESCRIPTION CARD - SYLLABUS

Course name
Polymer Processing Systems [S2IMat1>SPMP]

Course

Field of study
Materials Engineering

Year/Semester
1/2

Area of study (specialization)
Nanomaterials

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
15

Laboratory classes
15

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

dr hab. inż. Karol Bula prof. PP
karol.bula@put.poznan.pl

Lecturers

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 peripherial 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 peripherial 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:

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 peripherial 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 transpotation - calibration of working feeder.
2. Rotattional molding technique.
3. Adjusting of 3 axis linear robot for displace the injection molding part.
4. Mounting of mold on injection machine and set up the process parameters.
5. Profiles extrusion.
6. Extrusion blow molding of containres.

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. Stasiek , Wytlaczanie, 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	2,00
Classes requiring direct contact with the teacher	35	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	15	0,50