COURSE DESCRIPTION CARD - SYLLABUS

Course name
Polymer Processing Systems

Course

Field of study
Material Engineering

Year/Semester
1/2

Area of study (specialization)

Profile of study
general academic

Level of study
Second-cycle studies

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15	15	
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

1. Students have knowledge about the technological properties of materials. - [K2_W02, K2_W04].

2. Students know the most important recommendations regarding the processing parameters of polymeric materials and the criteria for the selection of auxiliary equipment. - [K2_W011].

3. Students have knowledge of how to formulate the most important guidelines for the components of devices in production lines and cells used in the processing of polymeric materials. - [K2_W011, K2_W013].

Skills

1. Students are able to shape the product by selecting the right technological process and tools - [K2_U08, K2_U11].

2. Students are able to design a simple technological process, taking into account machine efficiency, raw material circulation and product control. - [K2_U11, K2_U13].

3. Students are able to design a complex technological process, material and implement this project, evaluate technological solutions in connection with the field of material engineering. - [K2_U15, K2_U20].

Social competences

1. Students are aware of the importance of using plastic products in the economy and social life. - [K2_K02].

2. Students are open to cooperation with other specialists (constructors, quality control specialists). - [K2_K03].

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 5 to 6 questions (credit if at least 50.1% of correct answers are obtained). Up to 50.0% - ndst, from 50.1% to 60.0% - dst, from 60.1% to 70.0% - dst +, from 70.1% to 80.0% - db, from 80, 1% to 90.0% - db +, from 90.1% - very good.

Laboratoryclasses:

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	53	2,0
Classes requiring direct contact with the teacher	33	1,0
Student's own work (literature studies, preparation for laboratory classes, preparation for colloquium)[1]	20	1,0

[1] delete or add other activities as appropriate