



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Design of Plastic Parts

Course

Field of study

Materials Science

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

4/7

Profile of study

general academic

Course offered in

polish

Requirements

elective

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

3

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 basic knowledge of polymeric materials and also methods of their processing.

Course objective

Student should obtain knowledge about materials selection for making plastic parts and should know the roles important in design of plastic elements.

Course-related learning outcomes

Knowledge

1. Students have knowledge how to characterize and compare polymeric materials based on their properties and application. - [K_W08, K_W010].



2. Students have knowledge of the most important rules for the selection of engineering materials, taking into account the producibility of construction. - [K_W010, K_W012].

Skills

1. Students are able to take the information from data bases and literature in case of engineering materials. - [K_U01].

2. Student are able to give the most suitable polymer material for making plastic part used in machine building. - [K_U21].

3. Students are able to take into consideration some ecological aspects during designing of plastic parts. - [K_U12].

Social competences

1. Students underline the most important elements in designing process which are connected with the influence on the environment. - [K_K02].

2. Students are able to define priorities which are crucial in plastic part designing process. - [K_K04].

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.

Project

Passing on the credits based on projects implemented during the classes, containing calculations and drawings of details. All projects must be passed with positive note.

Programme content

Lecture

1. Designing of injection channles and sprues.
2. Designing with technological aspects of plastic part design.
3. Designing of snap-fit joints and welding joints.
4. Calculations and principles of designing gears, plastic plain bearings.
5. Designing of threads and leaving hinges.
6. Dimensional aspects in designing of injection molede parts.
7. Main roles in designing of plastic parts in case of their recycling.



Project

1. Designing of injection molding channels and sprues in cold mould.
2. Designing of plastic parts in case of technological and formability aspects.
3. Designing of package parts with leaving hinges.
4. Designing of welding points and snap fit joints.
5. Designing of plastic parts in case of maintain dimensional tollerances.

Teaching methods

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

Project: carrying out designs of injection-molded parts made of polymer materials, solving tasks, discussion, teamwork.

Bibliography

Basic

1. Zawistowski H., Frenkler D.: Konstrukcja form do tworzyw termoplastycznych, WNT, 2000, W-wa
2. Garbarski J. i in.: Części maszyn z tworzyw sztucznych, Oficyna Wydawnicza Politechniki Warszawskiej, W-wa, 2016.
3. Frącz W., Krywult B.: Projektowanie i wytwarzanie elementów z tworzyw sztucznych, wyd. Politechniki Rzeszowskiej, 2005.
4. Łączyński B.: Niemetalowe elementy Maszyn, wyd. WNT, W-wa 1998.

Additional

1. Wilczyński K. (red.): Wybrane zagadnienia przetwórstwa tworzyw sztucznych, Ofic. Wyd. Politechniki Warszawskiej, Warszawa, 2011.
2. Malloy R., Plastic part design for injection molding, wyd. Hanser, Monachium 2010.

Breakdown of average student's workload

	Hours	ECTS
Total workload	62	3,0
Classes requiring direct contact with the teacher	32	2,0
Student's own work (literature studies, preparation for laboratory classes, preparation for colloquium) ¹	30	1,0

¹ delete or add other activities as appropriate