



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Design of Plastic Parts [S1IMat1>PWTS]

### Course

Field of study

Materials Engineering

Year/Semester

4/7

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

elective

### Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

15

### Number of credit points

3,00

### Coordinators

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

### Lecturers

### 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:

student is be able to characterize and compare polymeric materials based on their properties and application.

student should know how to determine the material properties appropriate for selected item.

Skills:

student is able to take the information from data bases and literature in case of engineering materials.

student is able to give the most suitable polymer material for making plastic part used in machine building.

student is able to take into consideration some ecological aspects during designing of plastic parts.

Social competences:

student can underline the most important elements in designing process which are connected with the influence on the environment.

student is able to define priorities which are crucial in plastic part designing process.

### 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 (credit in case of obtaining at least 50,1% correct answers).

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

- 1 Technological features in general rules of plastic part design.
2. Designing of joining elements in plastic parts.
3. Designing of injection runners.
4. Dimensional aspects in designing of injection molding parts.

### Course topics

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 molding 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.: Nietalowe 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	50	2,00
Classes requiring direct contact with the teacher	25	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00