COURSE DESCRIPTION CARD - SYLLABUS

Course name
Processing of elastomeric materials [S1IMat1>PE]

Course

Field of study
Materials Engineering

Year/Semester
3/6

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
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

Basic knowledge of the polymer materials including cross-linked and uncured elastomers. Application of information taken from the literature survey concerning science and technical profile including materials science. Understanding of necessity of taking new information and knowledge

Course objective

Student should obtain knowledge about preparation, processing and post processing finishing of the of cross-linked elastomers and uncured

Course-related learning outcomes

Knowledge:
1. student have knowledge about the investigation method for obtaining technological properties of elastomers
2. student have particular information concerning methods for processing and recycling of cross-linked elastomers as well as of uncured elastomers

Skills:

1. student is able to take the detailed information from literature survey and give the short description of materials and their processing
2. student is well prepared to work with selected scientific equipment for polymer testing
3. student is ready for application of an appropriate processing techniques fo material shaping, with predefined internal structure and properties

Social competences:
1. student having knowledge about the role of engineering elastomers in macro-scale economy and the influence of engineering activity on the environment
2. student is ready for cooperation in workgroup

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 examination
Laboratory: every single training should be passed by giving the written answer and additional final report on a training

Programme content

Lecture:
1. Material science concerning rubber and fillers for rubber
2. Main components of rubber recipe
3. Selected methods for preparation of rubber mixture, technological properties of rubber mixture
4. Methods of continues and periodic vulcanization, assembly of tires
5. Methods for testing of cross-linked rubber and parts made of rubber
6. Material science and processing of thermoplastic elastomers, silicone and plasticized PVC
7. Recovery of tires, recycling of rubber products

Laboratory:
1. Processing of rubber mixture
2. Processing of highly-filled rubber, processing of rubber with addition of recycled scrap
3. Rubber vulcanization with monitoring the mold and part temperature
4. Rubber vulcanization of product differ with their thickness
5. Investigation of rubber properties, evaluation of cross-linking density
6. Determination of dynamic properties of rubber

Teaching methods

1. Lecture: multimedia presentation.
2. Laboratory exercises: performing exercises, discussion, team work.

Bibliography

Basic
1. Guma, Poradnik inżyniera i technika, Praca zbiorowa, WNT W-wa, 1981
2. Poradnik technologa gumy, IPG ?Stomil? Piastów 2003
3. B. Jurkowski, B. Jurkowska, Sporządzanie kompozycji polimerowych. Elementy teorii i praktyki. WNT, W-wa 1995.

Additional
1. Smorawiński A., Wtrysk elastomerów, Wyd. Plastech, W-wa 2001.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	32	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00