



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Technology of polymeric materials

Course

Field of study

Chemical Technology

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3/5

Profile of study

general academic

Course offered in

English

Requirements

elective

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars

15

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

dr inż. Piotr Gajewski

Responsible for the course/lecturer:

Wydział Technologii Chemicznej

Instytut Technologii i Inżynierii Chemicznej

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Prerequisites

Knowledge of the basic issues of general chemistry and organic chemistry.

Course objective

Obtaining basic knowledge about polymeric materials, their preparation and properties, as well as modern applications.

Course-related learning outcomes

Knowledge

Student has basic knowledge of the chemistry and technology of polymeric materials, as well as their properties and applications (K_W03). Has the necessary knowledge of both natural and synthetic raw materials, products and processes used in polymer technology (K_W9)

Skills

Is able to find the necessary information in the literature, databases and other sources concerning chemical sciences, interprets them properly, draws conclusions (K_U1). Can work both individually and in a team in academic environment (K_U2). Can prepare and present in Polish language an oral presentation in the scope of polymer technology (K_U4). Has the ability to self-educate (K_U6).

Social competences

Understands the need for learning and improving their professional, personal and social competences (K_K01). Can interact and work in a group, inspire and integrate engineering environments (K_K03). Can properly define priorities for the implementation of the assigned task (K_K04).

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Determining the final grade based on partial grades received during the semester during classes in direct contact with the teacher (online in "live view" mode with the webcam turned on via the eKursy platform):

Grade for preparing a paper in the form of a multimedia presentation on a selected topic related to properties and application of polymeric materials.

Grade for the team project on written form (online sent via the eKursy platform or by e-mail using the university e-mail system) and project defense.

Programme content

Knowledge of the structure of the most popular monomers and their polymers, such as e.g. polyolefins, vinyl polymers, rubbers, polyesters, polyamides, polyurethanes, epoxy and polyester resins, special polymers.

Structure of polymers (linear, branched, crosslinked), thermoplastics and duroplastics and their properties.



Plastic - concept, ingredients; composites. Preparation, properties and modification of polymeric materials in terms of their applications.

Become familiar with modern applications of plastics. Besides to commonly known applications, such as rubber, food, packaging, electrotechnical industries, construction, aviation, automotive, agriculture, the project will also cover plastics in cosmetics, medicine, pharmacy, dentistry, the computer industry, stereolithography (3D printers), microlithography, optoelectronics, microelectronics, etc.

Requirements for polymer materials depending on their target application.

Teaching methods

Project: Carrying out the particular stages of the project, solving problems related to the particular stages of the project, preparing multimedia presentations and the written part of the project, discussion.

Bibliography

Basic

1. S. Fakirov "Fundamentals of Polymer Science for Engineers", Wiley, 2017.
2. M. Rubinstein, R. H. Colby "Polymer Physics", Oxford, 2003.
3. R. A. Pethrick "Polymer Science and Technology for Scientists and Engineers", Whittless Publishing, 2010.
4. J. W. Nicholson "The Chemistry of Polymers", 5th ed., Royal Society of Chemistry, 2017.

Additional

1. A. Ravve "Principles of Polymer Chemistry", 3rd ed., Springer, 2012.
2. C.A. Harper. Ed. "Handbook of Plastics Technologies", 2006, e-book.
3. G.Odian "Principles of Polymerization", 4 th ed., Wiley, 2004.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation of presentation, project preparation) ¹	20	1,0

¹ delete or add other activities as appropriate