



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Technologia materiałów polimerowych (Technology of polymeric materials)

Course

Field of study

Year/Semester

Technologia chemiczna (Chemical Technology)

III/5

Area of study (specialization)

Profile of study

general academic

Level of study

Course offered in

First-cycle studies

Polish

Form of study

Requirements

full-time

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:

Responsible for the course/lecturer:

dr inż. Piotr Gajewski

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:

Presentations on the subject of the project, assessment of preparation, presentation and general knowledge. Written project on the issues presented in the project.

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. J. Pielichowski, A. Puszyński „Chemia Polimerów” TEZA, Kraków, 2004
2. J. Pielichowski, A. Puszyński „Technologia tworzyw sztucznych”, WNT, Warszawa, 1994
3. W. Szlezyngier „Tworzywa sztuczne” Oficyna Wydawnicza Politechniki Rzeszowskiej, Rzeszów 1996.
4. Z. Wirpsza „Poliuretany. Chemia, technologia, zastosowanie.” WNT Warszawa 1991.

Additional

1. Praca zbiorowa pod red. Z. Floriańczyka i S. Penczka „Chemia polimerów” tom II, III Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 1995 i 1997.
2. Scientific publications related to the subject of the project.

Breakdown of average student's workload

| | Hours | ECTS |
|--|-------|------|
| Total workload | 50 | 2,0 |
| Classes requiring direct contact with the teacher | 25 | 1,0 |
| Student's own work (literature studies, preparation of presentation, project preparation) ¹ | 25 | 1,0 |

¹ delete or add other activities as appropriate