STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Polymers and polimer composites	**1010702211010702974**

Field of study	Profile of study (general academic, practical)	Year /Semester
Chemical Technology	**general academic**	**1 / 1**
Elective path/specialty: **Composites and Nanomaterials**	Subject offered in: **Polish**	Course (compulsory, elective): **obligatory**
Cycle of study: **Second-cycle studies**	Form of study (full-time,part-time): **full-time**	
No. of hours: Lecture: **15** Classes: **-** Laboratory: **15** Project/seminars: **-**		No. of credits: **3**
Status of the course in the study program (Basic, major, other): **other**	(university-wide, from another field): **university-wide**	
Education areas and fields of science and art: **technical sciences** **Technical sciences**		ECTS distribution (number and %): **3 100%** **3 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Knowledge of the basic principles of general, organic and physical chemistry. Knowledge of subjects taught at ?Chemical technology ? polymeric materials? lecture.
2	**Skills**	Student knows and applies good practices of laboratory work, is able to operate the scientific equipment. He or she is able to search for information in scientific literature, databases and other properly chosen sources.
3	**Social competencies**	Student is conscious of the effects of engineering activity.

Assumptions and objectives of the course:

To get basic knowledge of polymers (chemistry, properties, applications).

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Student has a well established knowledge of synthesis, properties, aplication of polymers - [K_W02, K_W11]

Skills:

1. Student has the ability of analyzing and interpreting of the results of experiments from the area of polymer chemistry and technology - [K_U01, K_U10]
2. Student has the ability of presenting the results of laboratory exercises in concise and proper manner - [K_U06]

Social competencies:

1. Ttechnology, including environment protection - [K_K04, K_K02]
2. Student is conscious of limitation of his knowledge and understands the need of further continuous education in area of polymer chemistry and technology - [K_U01]
3. Students can work in a team and are aware of their responsibility for their work and responsibility for the results of the teamwork. - [K_U04]

Assessment methods of study outcomes

Written exam in the subject of polymeric materials presented at lectures, evaluation of laboratory exercises and reports.

Course description

Basic concepts (linear, branched and crosslinked polymers, molecular weight, tacticity). Basic characteristics of chain polymerization reaction: types, mechanisms, examples of polymers. Copolymerization and copolymers. Basic characteristics of step polymerization; mechanism, examples of polymers. Polymer morphology. Classification of polymeric materials (thermoplastics, thermosets, elastomers, thermoplastic elastomers). Polymer blends. Commodity, engineering and performance polymers. Thermal properties of polymers (thermal transitions, DSC measurements). Mechanical properties of polymers (tensile properties, stress-strain behavior failure, viscoelasticity, rheological models).

Basic bibliography:

1. G. Odian, Principles of Polymerization, 4th ed., Wiley, 2004
2. H.R. Allcock, F.W. Lampe Contemporary Polymer Chemistry, 2nd ed., Prentice Hall, 1990.

Additional bibliography:

1. L.H. Sperling Introduction to Physical Polymer Science, 4th ed., Wiley, 2006
2. Handbook of Plastics Technologies, C.A. Harper. Ed., 2006, e-book.

Result of average student's workload

Activity	Time (working hours)
1. Lecture	15
2. Consultations to lecture	10
3. Laboratory	15
4. Consultations to laboratory	10
5. Preparation for laboratory	20
6. Preparation of reports	5

Student's workload

Source of workload	hours	ECTS
Total workload	75	3
Contact hours	50	0
Practical activities	15	0