

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Polymer Chemistry		Code 1010702211010720506
Field of study Chemical Technology	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 1
Elective path/specialty Polymer Technology	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: 2 Classes: - Laboratory: 3 Project/seminars: -		No. of credits 5
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 5 100% 5 100%
Responsible for subject / lecturer: prof. dr hab. inż. Ewa Andrzejewska email: ewa.andrzejewska@put.poznan.pl tel. +48 61 665 3737 Faculty of Chemical Technology ul. Piotrowo 3 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Knowledge of the basic principles of general, organic, physical chemistry, and chemical engineering. 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: -Gaining of knowledge in the area of polymerization processes and chemical reactions of polymers on a specialistic level.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Student has a well-established and expanded knowledge in the field of methods and mechanisms of synthesis and modification of polymers. - [K_W02]		
Skills:		
1. Student has the ability of analyzing and interpreting of the results of experiments from the area of polymer chemistry - [K_U01]		
2. Student has the ability of presenting the results of laboratory exercises in concise and proper manner. - [K_U06]		
3. Student is able to choose the synthesis method and the process parameters in order to obtain a polymer with requested properties. - [K_U09]		
Social competencies:		
1. Student is conscious of limitations of science and technology in the area of polymer chemistry, including environment protection - [K_K01]		
2. Student is conscious of limitation of his knowledge and understands the need of further continuous education in area of polymer chemistry. - [K_K02]		
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_K04]		

Assessment methods of study outcomes		
-Written exam from the area of polymer chemistry, evaluation of laboratory exercises and reports.		
Course description		
<p>Processes of polymer synthesis and reaction mechanisms. Thermodynamics of polymerization. Radical polymerization (initiators, steps of reaction, polymerization kinetics), linear polymerization, polymerization with crosslinking, copolymerization, controlled (?living?) radical polymerization. Ionic polymerization (anionic, cationic, living). Kinetics of ionic polymerization. Coordination polymerization (process characteristics, catalysts, mechanisms). Polycondensation (polycondensation control, kinetics of chain formation, polycondensation of di- and multifunctional monomers, gel point, Flory's distribution). Polyaddition. Chemical reactions of polymers, degradation and stabilization of polymers.</p>		
Basic bibliography:		
1. Chemia polimerów, J. Pielichowski, A. Puszyński, TEZA, Kraków, 2004 2. Chemia polimerów tom I, . Praca zbiorowa pod red. Z. Floriańczyka i S. Penczka, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 1995		
Additional bibliography:		
1. Principles of Polymerization, 4-th edition, G. Odian, Wiley-Interscience:Hoboken, New York, 2004 2. Principles of Polymer Chemistry, 2-nd edition, A.Ravve, Kluwer Academic/Plenum Publishers, New York, 2000		
Result of average student's workload		
Activity	Time (working hours)	
1. Lectures	30	
2. Laboratory exercises	45	
3. Preparation for exam, exam	30	
4. Preparation for laboratory exercises	10	
5. Preparation of reports from labor. exercises.	10	
Student's workload		
Source of workload	hours	ECTS
Total workload	125	5
Contact hours	75	3
Practical activities	45	2