

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Green chemistry and polymeric materials recycling</b>		Code <b>1010702231010702972</b>
Field of study <b>Chemical Technology</b>	Profile of study (general academic, practical) <b>general academic</b>	Year /Semester <b>2 / 3</b>
Elective path/specialty <b>Polymer Technology</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>Second-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>15</b> Classes: <b>-</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>4</b>
Status of the course in the study program (Basic, major, other) <b>basic</b>		(university-wide, from another field) <b>university-wide</b>
Education areas and fields of science and art <b>technical sciences</b> <b>Technical sciences</b>		ECTS distribution (number and %) <b>4 100%</b> <b>4 100%</b>
<b>Responsible for subject / lecturer:</b>  dr inż. Dominik Paukszta email: Dominik.Paukszta@put.poznan.pl tel. 61665-3549 Faculty of Chemical Technology ul. Berdychowo 4 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Students have the necessary knowledge in the field of chemistry and polymer processing.
2	<b>Skills</b>	Students are able to search the necessary information from literature, databases and other sources.
3	<b>Social competencies</b>	Students understand the need for further education and improvement of their professional, personal and social skills. They are aware of the effects of their activities and can think and act in an entrepreneurial manner.
<b>Assumptions and objectives of the course:</b> The aim of the lectures is as follows: - provide students with the methods of polymer recycling and polymer recovery, - present the most important problems with legislation, economy and ecology related to the subject, - teach the students about the recycling technologies of most common polymers.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Students have a broader and deeper knowledge about polymers and their influence on the natural environment. They are familiar with the methods of polymer recycling and recovery, which enables to solve the tasks connected with their reprocessing - [K_W02]		
2. Students have expanded knowledge about environmental protection associated with chemical processes - [K_W08]		
<b>Skills:</b>		
1. Students are able to independently assess and determine the direction for further education (on the basis of acquired information from literature, databases and other sources), and to pursue self-directed learning - [K_U05]		
2. Students have the ability to adapt the knowledge of polymer processing technology to solve problems in the field of polymer recycling and to plan new technological processes - [K_U12]		
3. Students can rationally plan the use of recycled polymers, guided by the principles of environmental protection and sustainable development - [K_U13]		
<b>Social competencies:</b>		
1. Students shape their awareness of the limitations of science related to chemical technology and environmental protection - [K_K02]		

<b>Assessment methods of study outcomes</b>		
Written test.		
<b>Course description</b>		
<p>The most important topics of lectures on polymer recycling are given below.</p> <p>The importance of polymer recycling and recovery. Ecological and economical aspects of reused plastics. The system of waste management in Poland and in Europe. Life Cycle Assessment (LCA) of plastics, especially in packaging industry. Recycling in the automobile industry. The main sources of used plastics: car industry, electrochemical industry, civil engineering (e.g. profiles, rain-pipes, PVC windows), food industry containers and other.</p> <p>Identification and segregation of polymers. The methods of polymers recycling and recovery, especially for polyolefines, polyesters, PVC and others. Biodegradable polymers: types, technologies, application, biodegradation. Devising technologies connected with polymer recycling.</p>		
<b>Basic bibliography:</b>		
1. A. K. Błędzki ? ?Recykling materiałów polimerowych?, WNT 1997 2. H. F. Lund ? The McGraw-Hill RECYCLING HANDBOOK, USA, The McGraw-Hill Companies, 2001 3. A. L. Andradý ? ?Plastics and the Environment?, Wiley-Interscience, 2003 4. M. Chanda, S. K. Roy ? ?Plastics and Fabrication and Recycling?, CRS Press Taylor&#38;Francis Group, 2008		
<b>Additional bibliography:</b>		
1. 1. ?Recykling i odzysk materiałów polimerowych?, Materiały konferencyjne Wrocław/Szczecin, 2000 ? 2013		
<b>Result of average student's workload</b>		
Activity	Time (working hours)	
1. Lectures	15	
2. Consultation to lectures	25	
3. Presentation of solved problem	13	
4. Consultation to problems	20	
5. Preparation for written test	25	
6. Written test	2	
<b>Student's workload</b>		
Source of workload	hours	ECTS
Total workload	100	4
Contact hours	62	0
Practical activities	13	0