



STUDY GUIDE

Plastic processing

Organised by

Poznan University of Technology





1. IDENTIFYING DATA.

· Course Name.	<i>Plastic processing</i>
· Coordinating University.	<i>Poznan University of Technology</i>
· Partner Universities Involved.	-
· Course Field(s).	<i>Engineering of polymeric materials - technologies of plastic processing, their applications, properties, modification, composites' production</i>
· Related Study Programme.	-
· ISCED Code.	<i>0722</i>
· SDG.	<i>12</i>
· Study Level.	<i>Bachelor (B), Master (M)</i>

· Number of ECTS credits allocated.	<i>2</i>
· Mode of Delivery.	<i>Online self-study</i>
· Language of Instruction.	<i>English</i>
· Course Dates.	<i>March – June 2025</i>
· Schedule of the course.	-
· Key Words.	<i>Plastics, polymeric materials, processing, modification, polymeric composites</i>
· Catchy Phrase.	<i>Plastic is fantastic – tutorial on how to make a good use of it</i>

· Prerequisites and co-requisites.	<i>A student should have basic knowledge of chemistry, mechanics and strength of materials.</i>
· Number of EUNICE students that can attend the Course.	<i>40</i>
· Course inscription procedure(s).	-

2. CONTACT DETAILS.

· Department.	<i>Faculty of Mechanical Engineering</i>
· Name of Lecturer.	<i>dr inż. Monika Dobrzyńska-Mizera</i>
· E-mail.	<i>monika.dobrzynska-mizera@put.poznan.pl</i>
· Other Lecturers.	-



3. COURSE CONTENT.

Technological processes used in plastics' processing (e.g. injection, extrusion, lamination, vacuum forming, 3D printing). Phenomena occurring during various plastics processing processes. The influence of technological parameters of processing on the properties of manufactured plastic products. Typical defects of plastic products made using various technologies and ways to prevent them. Directions of development of modern plastics processing technologies. Examples of plastic products and analysis of their material composition. Construction of basic tools used in plastics processing. Basic knowledge of peripheral equipment used in polymer materials processing technologies. Polymers and their modifications used in a production of plastic products.

4. LEARNING OUTCOMES.

1. A student has basic knowledge of selected chemical matters necessary to understand basic technological processes.
2. A student has basic knowledge of technical mechanics, strength of materials and general principles of engineering structures, as well as technologies for producing and processing engineering materials.
3. A student is able to select appropriate manufacturing technologies to design products, their structure and properties, recognizing social, economic, ecological and legal aspects.
4. A student is able to obtain information from literature, databases and other sources, integrate it, interpret it and draw conclusions, as well as formulate and justify opinions.
5. A student is able to work on a given task independently and cooperate in a team, assuming various roles, demonstrates professionalism and responsibility for decisions made.
6. A student acts in accordance with the principles of professional ethics and is responsible for the reliability of the results of their work.

5. OBJECTIVES.

Learning about issues related to basic plastics processing technologies, physicochemical processes occurring during the processing of polymeric materials and analysis of factors affecting the quality of manufactured products.

6. COURSE ORGANISATION.

UNITS

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| 1. | <i>Introduction to polymeric materials</i> |
| 2. | <i>Injection molding and extrusion as high-tech manufacturing technologies</i> |
| 3. | <i>Low volume processing – 3D printing, lamination, thermoforming</i> |
| 4. | <i>Selection of polymeric-based materials for various applications</i> |



5.	<i>Thinking green: sustainability of polymeric-based materials</i>
LEARNING RESOURCES AND TOOLS.	
<i>Learning materials (.pptx or .pdf), videos, links</i>	
PLANNED LEARNING ACTIVITIES AND TEACHING METHODS.	
<i>Online self-study</i>	

7. ASSESSMENT METHODS, CRITERIA AND PERIOD.	
<i>Online test at the end of the course (min. 60% to pass)</i>	
OBSERVATIONS.	

8. BIBLIOGRAPHY AND TEACHING MATERIALS.	
<p><i>Enrique Saldívar-Guerra, Eduardo Vivaldo-Lima, Handbook of Polymer Synthesis, Characterization, and Processing, Wiley 2013, ISBN 9781118480793.</i></p> <p><i>Ulf W. Gedde , Mikael S. Hedenqvist, Minna Hakkarainen, Fritjof Nilsson, Oisik Das, Applied Polymer Science, Springer 2021, ISBN 9783030684723.</i></p> <p><i>Journals: Plastics Review, Rubber Review, Plast News.</i></p>	

