GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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| Subject name and code | Machines in plastics processing, PG_00060804 | | |
| Field of study | Chemical Technology | | |
| Date of commencement of studies | October 2023 | Academic year of realisation of subject | 2025/2026 |
| Education level | first-cycle studies | Subject group | Optional subject group<br>Subject group related to scientific research in the field of study |
| Mode of study | Full-time studies | Mode of delivery | at the university |
| Year of study | 3 | Language of instruction | Polish |
| Semester of study | 6 | ECTS credits | 2.0 |
| Learning profile | general academic profile | Assessment form | assessment |
| Conducting unit | Department of Polymer Technology -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr hab. inż. Justyna Kucińska-Lipka | |
| | Teachers | dr hab. inż. Justyna Kucińska-Lipka<br>dr inż. Krzysztof Formela<br>dr inż. Maciej Sienkiewicz<br>dr inż. Marcin Włoch<br>prof. dr hab. inż. Janusz Datta<br>dr inż. Ewa Głowińska | |

| Lesson types | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 15.0 | 0.0 | 15.0 | 0.0 | 0.0 | 30 |
| | E-learning hours included: 0.0 | | | | | | |
| | eNauczanie source addresses:<br>Moodle ID: 4438 2025/2026 - Maszyny w przetwórstwie tworzyw sztucznych<br>https://enauczanie.pg.edu.pl/2025/course/view.php?id=4438 | | | | | | |

| Learning activity and number of study hours | | | | | |
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| | Learning activity | Participation in didactic classes included in study plan | Participation in consultation hours | Self-study | SUM |
| | Number of study hours | 30 | 2.0 | 18.0 | 50 |

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| Subject objectives | The aim of the course is to learn about the types of machines used in the plastics industry, their construction, equipment, principles of operation and use in the production of plastic products. |

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| Learning outcomes | Course outcome | Subject outcome | Method of verification |
| | [K6_K05] is aware of the social role of a technical university graduate, and in particular understands the need to formulate and communicate to the public, in particular through the mass media, information and opinions on the achievements of technology and other aspects of engineering activity | The student is able to communicate information—both in technical and popular science contexts—regarding the machinery and equipment used in the plastics industry, as well as the everyday products manufactured using them. The student is aware of the social role of engineers in disseminating scientific and technical knowledge in a way that is accessible and understandable to diverse audiences. | [SK2] Assessment of progress of work<br>[SK4] Assessment of communication skills, including language correctness |
| | [K6_W05] has knowledge of chemical technology based on mineral or energy resources and modern energy sources, understands the concept of sustainable development, knows the principles of green chemistry and environmentally friendly process engineering, has knowledge of occupational safety in the chemical industry | The student will have knowledge of the construction and operation of basic equipment used in plastics and rubber processing. The student will have knowledge of occupational health and safety in the plastics industry. | [SW1] Assessment of factual knowledge<br>[SW3] Assessment of knowledge contained in written work and projects |
| | [K6_U07] recognizes and identifies the basic polymer processing methods used in industry, classifies and differentiates the equipment used for these purposes | The student can describe the operating principles and uses of machines and equipment used in the plastics industry. The student can explain the differences between the operation of various machines and equipment and the products they produce. | [SU2] Assessment of ability to analyse information<br>[SU3] Assessment of ability to use knowledge gained from the subject |
| | [K6_W09] has knowledge of the technological and functional properties of polymers, the physical basis and processing methods of polymers and rubber | The student knows and is able to list and characterize in detail the basic methods of plastics processing. | [SW1] Assessment of factual knowledge<br>[SW3] Assessment of knowledge contained in written work and projects |

**Subject contents**

Course content – lecture

Types, construction, and operating principles of machines in the plastics industry: injection molding machines, extruders, blow molding machines, thermoforming machines, mills, rolling machines, calenders, mixers and agitators, presses, vulcanizing machines, dosing and mixing units, chemical tanks and reactors. Principles of safe work with industrial machinery.

Course content – laboratory

- Construction and Principles of Operation of an Injection Molding Machine
- Construction and Principles of Operation of an Extruder
- Construction and Principles of Operation of a Thermoforming Machine
- Construction and Principles of Operation of a Rolling Mill and Hydraulic Press
- Construction and Principles of Operation of a Dosing and Mixing Unit

**Prerequisites and co-requisites**

Basic knowledge of chemical machinery

**Assessment methods and criteria**

| Subject passing criteria | Passing threshold | Percentage of the final grade |
|---|---|---|
| laboratory: attendance, tests, reports, activity during classes | 85.0% | 45.0% |
| lecture: written test | 60.0% | 55.0% |

**Recommended reading**

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| Basic literature | • R. Sikora: Przetwórstwo tworzyw wielkocząsteczkowych, Wydawnictwo Edukacyjne Zofii Dobkowskiej, 1993<br>• K. Wilczyński (Red.): Przetwórstwo tworzyw polimerowych. Laboratorium, Wydawnictwo Politechniki Warszawskiej, 2025 |
| Supplementary literature | Detailed literature recommended by the lecturers |
| eResources addresses | |

**Example issues/ example questions/ tasks being completed**

- Construction and operation of an injection molding machine
- Construction and operation of an extruder
- Construction and operation of a thermoforming machine
- Construction and operation of a rolling mill
- Construction and operation of a dosing and mixing unit

**Practical activites within the subject**

Not applicable

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