



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Technological lines in waste-free production systems

### Course

Field of study

Mechanical Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

3/6

Profile of study

general academic

Course offered in

polish

Requirements

elective

### Number of hours

Lecture

12

Laboratory classes

4

Other (e.g. online)

Tutorials

Projects/seminars

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

prof. Marek Szostak

Responsible for the course/lecturer:

dr Waldemar Matysiak

### Prerequisites

Basic knowledge of machine construction, founding, plastic working and processing of plastics

### Course objective

Understanding the construction of technological lines used in the casting production processes, in plastic working processes and in the processing of plastics

### Course-related learning outcomes

Knowledge

1. The student has knowledge of the construction of basic components and elements used in machines and technological devices for material processing.
2. The student knows the construction of basic devices used in foundry, plastic working and processing of polymeric materials.
3. The student knows what process (part of the process) is carried out by the technological lines



### Skills

1. Student is able to correctly select machines or devices for a specific process in material processing technology: molding, plastic working, plastic processing.
2. The student is able to plan the process of operating a machine or device in the processes of material processing technology.

### Social competences

1. The student is able to work on a designated task independently and work in a group.
2. The student understands the need for continuous learning to improve professional qualifications.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:

Written credit carried out at the end of the semester (credit if at least 50.1% of correct answers are obtained). Up to 50.0% - ndst, from 50.1% to 60.0% - dst, from 60.1% to 70.0% - dst +, from 70.1% to 80.0% - db, from 80, 1% to 90.0% - db +, from 90.1% - very good.

Laboratory:

Passing on the basis of an oral or written answer regarding the content of each performed laboratory exercise, a report on each laboratory exercise according to the instructions of the laboratory teacher. In order to pass the laboratories, all exercises must be passed (positive grade from the answers and the report).

### Programme content

Lecture:

1. Drives, typical elements of machines and technological devices. Construction, principle of operation and purpose of machines and devices for die casting, low and high pressure, thixotropic, centrifugal and continuous casting. Selection of machines and devices depending on the quality requirements of castings.
2. Classification and characteristics of machines and devices for metal forming. Construction of machines: hammers, presses, spinning machines, rolling mills, bending machines, threading machines, etc. , joining by plastic working methods).
3. Construction of basic machines for plastics processing (injection molding machines, extruders, vacuum molding machines, rotomoulding machines), their functional systems and the principle of operation. Description of several technological lines for processing and discussion of their advantages and disadvantages. Selection of machines and devices depending on the planned production process of plastic products.

Laboratory:



1. Construction and operation of machines for plastics processing.
2. Construction and operation of machines for plastic working.

### Teaching methods

The lecture is illustrated with a multimedia presentation containing the discussed program content.

Demonstration laboratory.

### Bibliography

Basic

1. Fedoryszyn A., Smyk K., Ziółkowski Z., Maszynoznawstwo odlewnicze, Wyd. AGH Kraków, 2008
2. Chudzikiewicz R., Mechanizacja i automatyzacja odlewni, WNT, Warszawa 1980.
3. Gولاتowski T.: Mechanizacja i automatyzacja w tłocznictwie, WN-T Warszawa 1978.
4. Haponiuk J.T.: Tworzywa sztuczne w praktyce. Wyd. Verlag Dashofer, W-wa 2008.
5. Pr. Zbiorowa: Poradnik Tworzywa Sztuczne. Wyd. WNT, Warszawa 2006.

Additional

1. Poradnik inżyniera mechanika. T.3. Zagadnienia technologiczne, rozdz. III, VI, VII. WNT, Warszawa 1970.
2. Erbel S., Gولاتowski T., Kuczyński K., Marciniak Z.: Technologia obróbki plastycznej na zimno. Warszawa: SIMP 1983.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	25	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	25	1,0

<sup>1</sup> delete or add other activities as appropriate