

SYLLABUS

Name: Production processes and technologies

Name in Polish: Procesy i techniki produkcyjne

Name in English: Production processes and techniques

Information on course:

Course offered by department:	Faculty of Organisation and Management
Course for department:	Silesian University of Technology
Study level and form:	Master's degree /Bachelor's degree, Full-time
Term:	summer semester 2024/2025
Coordinator of course edition:	Magdalena Palacz, Ph.D., D.Sc.

Default type of course examination report:

Language:

English

Course homepage:

[\[link\]](#)

ECTS

4

Short description:

The aim of the course is to present basic issues related to production engineering, processes, technologies and manufacturing techniques as well as methods of their design, description and analysis, and to acquire knowledge of basic processes of processing and reworking of the most frequently used technical materials.

Description:

Lecture:

1. Manufacturing, overview, definition; Materials in Manufacturing – metals, ceramics, polymers, composites; Manufacturing Processes – overview; Production Systems – overview;
2. Definitions of product, customer, process, industries – traditional and modern; basic trends in modern production technologies; classification of production types, basic manufacturing system models,
3. Materials in manufacturing; nature of materials, mechanical properties; metals – steel as an industrial base.
4. Materials in manufacturing – non-ferrous metals, ceramics, polymers and composites. Fundamentals of metal casting, metal casting process.
5. Glass working, shaping processes for plastics, processing of polymers.
6. Metal forming – overview, material behaviour, temperature in metal forming, stresses and strains, etc.; processing of composites and plastics;
7. Metal machining technologies – types, the tools, cutting conditions;
8. Material removal technologies – abrasive, non-traditional; joining technologies,
9. Joining and assembly technologies – overview. Manufacturing Systems – work transport, material handling, assembly systems, etc.
10. Production planning.

Exercises: The project includes a comprehensive work including development of What are the objectives of my product? What are the performance requirements? How this component will be operated? Does it need any special treatment? (requirement analysis). Is it possible to develop several design concepts? How many? How will it affect the production technique? What are the benefits? On the bases of the analysis performed select the proper design. The technical drawing with documentation describing the technology process to produce your component. This is the crucial element of the project. Information about the material and its requirements should be performed. A clear technical drawing is obligatory. A technology card would be beneficial. Validate (even theoretically) the level of satisfaction of the initial requirements.

Laboratory: Laboratory is organised as a studio visit to real working production companies.

Number of hours of classes with direct participation of academic teachers or other persons teaching courses and students

Contact hours:

Lecture: 15h/Exercises: 30h/Laboratory: 15h

Lecture credit: 2h

Laboratory credit: 3h

Student's own work

Preparation for lecture credit: 30h

Exercises preparation: 55h

Preparation for the project presentation: 20h

Total workload: 160

Number of ECTS credits: 4

including Number of ECTS credits covered by the study programme to be earned as part of the courses taught with the direct participation of academic teachers or other persons teaching courses and students: 2
Bibliography:
1. Projektowanie procesów technologicznych. Od laboratorium do instalacji przemysłowej by L. Synoradzki (red.), J. Wisiański (red.) 2. Podstawy projektowania procesów technologicznych typowych części maszyn by Mieczysław Feld 3. Production Process and Technical Change by Mario Morroni 4. Environmentally Improved Production Processes and Products An Introduction by Lucas Reijnders (auth.) 5. Manufacturing and Management by Myer Kutz
Learning outcomes:
<u>KNOWLEDGE: the student knows and understands</u> K1A _W3 Basic engineering processes and technologies in the life cycle of technical equipment, objects and systems and ways of solving typical engineering tasks, particularly in relation to the organization of production processes and production management. <u>SKILLS: the student is able to</u> K1A _U4: When identifying and formulating specifications for engineering tasks connected to production processes and technologies and solving them: -select and use analytical, simulation and experimental methods, including computer-aided methods, -recognize their system and non-technical aspects, including ethical aspects -make preliminary economic assessment of the proposed solutions and engineering actions taken, -analyse technology transfer and innovation. K1A _U6: Design - in accordance with the given specification – the new and supervise existing objects, production and exploitation processes and systems, using appropriate methods, techniques, tools, and materials. K1A _U8: Solve practical engineering tasks taking into account engineering standards and norms and applying specific technologies appropriate to production engineering, using experience gained in a professional engineering environment. <u>SOCIAL COMPETENCE: the student is ready for</u> K1A _K1: Critical evaluation of knowledge and received content, recognition of the importance of knowledge in solving cognitive and practical problems, and consulting experts in the event of difficulties in solving problems on their own.
Assessment methods and assessment criteria:
Lecture: Written test with multiple choice questions. Passing criteria: minimum 50% of correct answers Project: Documented project work. Passing criteria: providing and presenting the project work in accordance with the specified requirements of the project task Laboratory: written reports describing the visited places. The total note for this subject is a standard mean of notes from lecture, project, and laboratory. All parts must be positive (>3.0). Knowledge of the content of the subject is evaluated on the basis of the final exam (a multiple-choice questionnaire). It is obligatory to obtain a positive note during the semester to join the exam. A very good final grade exempts from the examination.
Practical placement:
Not applicable