SYLLABUS

Name: Production processes and techniques 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:	Bechelor's degree, Full-time
Term:	winter semester 2020/2021
Coordinator of course edition:	Magdalena Palacz, Ph.D., D.Sc.

Default type of course examination report:
credit
Language:
English
Course homepage:
(link)
ECTS

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.

Materials in manufacturing – non-ferrous metals, ceramics, polymers and composites. Fundamentals of metal casting, metal casting process.
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.

Project: 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: 30h Project: 15h Laboratory: 15h

Lecture credit: 2h Project credit: 5h Laboratory credit: 3h

Student's own work Preparation for lecture credit: 30h Project preparation: 60h Preparation for the project presentation: 20h

Total workload: 180

Number of ECTS credits: 6

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. Wisialski (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:

The student knows and understands:

K1P_W09 selected issues in materials sciences, chemistry, and the study of the structure and properties of materials

K1P_W11 selected issues in basic manufacturing techniques and technological design

K1P_W12 principles and methods for the design and optimization of production systems and processes, production planning and control, and fundamentals of flexible production systems

The student can:

K1P_U07 design - according to a given specification - and produce a simple technical system and implement a technological process, using appropriately selected methods, techniques, tools and materials

The student is ready:

K1P_K06 to cultivate and disseminate patterns of proper conduct in the work environment and beyond, make independent decisions, and critically assess his/her own actions, the actions of teams he/she manages and of organisations he/she participates in, and to take responsibility for the consequences of such actions

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