



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Designing technological processes

Course

Field of study

Management and Production Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

4/7

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

8

Laboratory classes

Tutorials

Projects/seminars

8

Other (e.g. online)

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

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Faculty of Mechanical Engineering

Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Knowledge

Basic knowledge of materials technology, technical drawing, metrology and manufacturing techniques

Skills

Ability to use literature (acquiring knowledge from indicated sources) and the Internet

Social competences

Understanding the need to expand your competences, readiness to work in teams

Course objective

Getting to know the basics of designing technological processes of machine parts.



Course-related learning outcomes

Knowledge

1. Define the concept of technology and technology of machines and define the scopes that machine technology deals with as a science - [K_W03]
2. List the basic organizational units of a machine building plant with a full production cycle - [K_W09]
3. Define the concept and divide the technological process into basic and auxiliary components and define the characteristic features of the technological operation and treatment - [K_W08]
4. Present the structure of the technical standard of working time and provide ways of determining the value of its components and define the components of the time consumed at the workplace - [K_W09]

Skills

1. Use technological standards to determine the values of machining parameters - [K_U01]
2. Determine the framework technological process for the selected part of the stepped shaft type on the basis of the executive drawing - [K_U16]
3. Analyze and correct the drawing of a stepped shaft part in terms of dimensioning, accuracy and surface roughness, processing bases and conformity of markings according to PN - [K_U14]
4. Calculate the value of the technical standard of working time on the basis of the calculated values of the unit time as well as preparation and completion time - [K_U12]
5. Use the understanding of the indicated sources of knowledge (list of basic literature) - [K_U28]

Social competences

1. Actively engage in design classes in solving given problems - [K_K01]
2. Cooperate within the project team and fulfill the assigned duties as part of the division of labor in the team - [K_K03]
3. Demonstrate responsibility for their own work and joint responsibility for the effects of the work of the entire team in the form of demonstrating basic orientation in the scope of the entire project - [K_K09]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formative assessment:

- a) in the field of exercises: based on the assessment of the current progress in the implementation of tasks,
- b) in the field of lectures: on the basis of answers to questions about the material discussed in previous lectures

Summative assessment:

- a) in terms of exercises on the basis of:
 - (1) public presentation on the topic indicated by the teacher,
 - (2) post-presentation discussion,
 - (3) the form and quality of the prepared materials,
- b) in the field of lectures:
 - (1) pass in the form of open-ended questions and a selection test, with at least one correct answer, each



question is scored on a scale from 0 to 1; the exam is passed after obtaining at least 55% of the points.
(2) discussion of the test results.

Programme content

LECTURE

1. Definitions of basic terms: technology, machine technology, production process, technological process, etc.

2. Cognitive areas of machine technology

3. Organizational division of a machine building plant with a full production cycle

Types of departments, divisions and organizational units of a machine building plant.

Discussion of the tasks of the organizational units included in the production department with particular emphasis on the straightening, cutting and centering processes.

Discussion of the tasks of the organizational units included in the part machining department, with particular emphasis on machining, heat treatment, and surface treatment.

The role of organizational units included in the auxiliary department.

Service department and the role of warehouse management, transport, energy, communication, sanitary-technical and administrative-economic departments.

4. The course of production in a machine building plant with a full production cycle.

5. Basic components of the technological process

Technological operation and its characteristics.

Technological treatment and its varieties.

6. Auxiliary components of the technological process.

Division of the technological operation into transitions of activities, working movements and elementary grips.

Areas of interest and in-depth analysis of the technologist and ergonomist in relation to the auxiliary components of the technological process.

7. Examples of the division of the technological process of an axially symmetrical part in a system hierarchical

8. Principles of technological process standardization

Defining the concept of a technical standard of working time.

Basic tasks of technical standardization of working time.

Factors necessary to properly establish the technical standard of working time.

Division of the time used at the workplace with particular emphasis on the components of working time and break time.

Standard and non-standard time.

Diagram of the technical structure of the working time standard and the rules for determining the value of its components.

Definitions of preparation and completion, unit, main (machine, machine-manual and manual), complementary and auxiliary times.

DESIGN

Title: Development of the technological process of parts such as a stepped shaft, sleeve or shield



Components of the project (program content):

1. Title page (according to the provided pattern)
2. Output drawing of the indicated workpiece, such as a stepped shaft, disc or sleeve
3. Analysis of the correctness of the output drawing in terms of applicable standards and rules of technical drawing
4. Improved executive drawing
5. Production program broken down into batches
6. Selection of the starting material (semi-finished or pig iron) with drawing of pig iron (forgings, casting, molding, etc.)
7. Technological process sheet (variant for medium-series production)
8. Instruction cards for individual operations and treatments (including heat treatment and technical control) with the selection of machining parameters, cutting tools and control and measuring instruments
9. Calculating the values of machining parameters
10. Calculation of the labor consumption of the part (determination of the technical value of the working time standard).
11. Selection of machine tools and their technological characteristics
12. List of tools and instrumentation
13. Control system - receipt of batch of products
14. Discussion on the obtained results

Teaching methods

Lecture: illustrated with a multimedia presentation containing the discussed program content

Project: student's independent work, design consultations, discussion

Bibliography

Basic

1. Feld M., Podstawy projektowania procesów technologicznych typowych części maszyn, WNT, Warszawa 2003
2. Feld M., Projektowanie procesów technologicznych typowych części maszyn, WNT, Warszawa
3. Poradnik Inżyniera, Obróbka skrawaniem. WNT, Warszawa 2001.
4. Wołk R., Normowanie czasu pracy na obrabiarkach do obróbki skrawaniem. WNT, Warszawa.

Additional

1. Dobrzański T., Rysunek techniczny maszynowy, WNT, Warszawa 2005.



Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	20	1,0
Student's own work (literature studies, preparation for exam, project preparation) ¹	30	1,0

¹ delete or add other activities as appropriate