



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Numerically Controlled Machine Tools

Course

Field of study

Management and production engineering

Area of study (specialization)

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

1/1

Profile of study

general academic

Course offered in

polski

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

PhD Eng. Wojciech Ptaszynski

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Faculty of Mechanical Engineering

ul. Piotrowo 3, 60-965 Poznan

Responsible for the course/lecturer:

Prerequisites

Basic in the field of machine science, machine parts, engineering graphics and other areas of education in the field of study. Basic knowledge of cutting tools and metalworking as well as electrical engineering. Ordered theoretical knowledge in the field of study. Ability to use literature (acquire knowledge from the indicated sources) and the Internet

Course objective

Understanding the principles of construction, operation and operation of numerically controlled machine tools as well as their controls and machining programming.

Course-related learning outcomes

Knowledge



Has detailed knowledge of machinery and technological equipment including numerically controlled (OSN), construction and operating principles, drives (main, feed and auxiliary) of CNC machine tools.

Skills

Is able to select machines and CNC devices for the implementation of product production processes, analyze and evaluate their construction, select components, plan and supervise maintenance tasks to ensure reliable operation.

Social competences

The student can work in a group. The student is aware of the possibilities of modern numerically controlled machine tools.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Completion of the laboratory based on the reports

Exam covering all issues in the form of a test.

Programme content

- Division and requirements for CNC machine tools.
- Drive and servo drive systems: main and feed (DC, AC and linear types),
- Analog and digital measuring systems,
- Mechanical components and principles of machine tools construction,
- Review and characteristics of currently produced CNC machine tools, machining centers,
- Development trends (direct drives, electric spindles, machine tools for HSM and HSC,
- Testing functional groups of CNC machine tools,
- Division, principles and methods of programming CNC machine tools,
- Structure and construction of control systems,

Teaching methods

Lecture illustrated by multimedia presentations

Bibliography

Basic

1. Kosmol J.: Serwonapędy obrabiarek sterowanych numerycznie, WNT Warszawa, 1998.
2. Kosmol J.: Automatykacja obrabiarek i obróbki skrawaniem, PWN Warszawa, 2000.



3. Singh N.: CNC programming and control, by John Wiley & sons, Inc. London, 1996.

Additional

1. Programowanie ISO. Podręcznik użytkownika. Heidenhain, 1994 (w języku polskim, angielskim i niemieckim).

2. Kief Hans B.: NC/CNC Handbuch, Carl Hanser, Verlag Munchen, 1998

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	45	1,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	30	1,5

¹ delete or add other activities as appropriate