



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Machine tools and CNC control systems

Course

Field of study

Year/Semester

Construction and Exploitation of Means of Transport

3/6

Area of study (specialization)

Profile of study

Virtual Engineering Design

general academic

Level of study

Course offered in

First-cycle studies

polish

Form of study

Requirements

full-time

compulsory

Number of hours

Lecture

Laboratory classes

Other (e.g. online)

30

15

0

Tutorials

Projects/seminars

0

0

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

Responsible for the course/lecturer:

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Faculty of Mechanical Engineering

Institute of Applied Mechanics

Division of Virtual Engineering

Jana Pawła II str. 24, 60-965 Poznań

Prerequisites

KNOWLEDGE: Metrology and measurement systems, Engineering graphics. Fundamentals of machine construction, Knowledge of health and safety rules when using CNC machine tools. Basic knowledge of machining. Knowledge of the construction and principles of operation of manually controlled machine tools

SKILLS: The ability to use various sources of information, including manuals and technical documentation



SOCIAL COMPETENCES: The student is able to work in a group, assuming different roles. The student demonstrates independence in solving problems, acquiring and improving his knowledge and skills.

Course objective

Presentation of modern manufacturing techniques using numerical control

To acquaint students with the construction of CNC machine tools, the basics of programming and advanced techniques of programming CNC machine tools.

Course-related learning outcomes

Knowledge

Student has knowledge of the construction, technological possibilities and application of CNC machine tools

Student knows how to choose a machine tool for a specific production task and determine the cutting parameters

Student has knowledge of building a CNC program and creating machining programs

Skills

Student is able to prepare a numerically controlled machine tool for work.

Student is able to select machining parameters and tools for a specific technological task.

Student can plan machining for CNC machine tools, select tools and machining parameters

Social competences

Student understands the need for personal development in the field of programming numerically controlled machine tools

Student is aware of the importance of decisions made in the field of numerically controlled machine tools programming in terms of the effects of environmental impact and responsibility for decisions made

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written credit for the lecture (test). Ongoing assessment of the state of knowledge in the laboratory.

Programme content

Basic concepts and terms. The principle of operation of a numerically controlled machine tool. Characteristic features of numerically controlled machine tools. Construction of executive units of a CNC machine tool. Classification and characteristics of control systems. Coordinate axes and turns of movements. Feed drive systems in CNC machine tools. Position and speed measurement systems in CNC machine tools. Basic methods of programming CNC machine tools. Automatic programming in a selected CAD / CAM system. Defining the tool. Machining simulation.



Teaching methods

Lecture with multimedia presentation

Laboratory - work on a computer in the Solid Works, SolidCAM environment

Bibliography

Basic

Kosmol J.: Automatykacja obrabiarek i obróbki skrawaniem, WNT, Warszawa, 2000.

Honczarenko J.: Obrabiarki sterowane numerycznie, WNT, Warszawa, 2008

Grzesik Wit, Piotr Niesłony, Marian Bartoszek, Programowanie obrabiarek NC/CNC, Wydawnictwa Naukowo-Techniczne, 2008

Documentation of machine tools from the laboratory of the Department of Virtual Engineering (Institute of Applied Mechanics)

Additional

Kosmol J.: Serwonapędy obrabiarek sterowanych numerycznie, WNT, Warszawa, 1998.

Habrat W.,: Obsługa i programowanie obrabiarek CNC. Podręcznik operatora. Wydawnictwo KaBe. Krosno, 2007

PN-93/M-55251 - Maszyny sterowane numerycznie. Osie współrzędnych i zwroty ruchów

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	45	1,5
Student's own work (literature studies, preparation for laboratory classes, preparation for tests) ¹	15	0,5

¹ delete or add other activities as appropriate