POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)
pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Testing and diagnostics of machine tools

Course

Field of study

Mechatronics

Year/Semester

2/3

Area of study (specialization)

Automation and Supervision of Production Systems

Profile of study

general academic

Level of study

Second-cycle studies

Course offered in

polski

Form of study

full-time

Requirements

elective

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

PhD Eng. Wojciech Ptaszynski

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tel. 61 665 2039

Faculty of Mechanical Engineering

ul. Piotrowo 3, 60-965 Poznan1/

Responsible for the course/lecturer:

Prerequisites

Basic knowledge of the construction of CNC machine tools. Ability to use literature (acquire knowledge from the indicated sources) and the Internet.

Course objective

Understanding the factors affecting the accuracy of CNC machine work, methods for checking the accuracy of the machine tool and familiarizing with modern methods of measuring and checking the accuracy of CNC machine tools

Course-related learning outcomes

Knowledge

Has detailed knowledge regarding the methods of checking and diagnosing machine tools

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Skills

Able to carry out machine checking tests using dial indicators and rulers, is able to interpret the results of machine tool tests

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:

Final exam in the form of a test

Programme content

Lecture:

- Characteristics of standards for measuring and assessing the accuracy of CNC machine tools

- Knowledge of the principles of work and measurements with a laser interferometer in the field of positioning accuracy measurements, angle deviations and motion straightness,

- Learning the types of positioning errors, methods and ways of compensating errors of measuring systems,

- Getting to know the QC-10 Ballbar, measurement methods and results interpretation,

- Learning methods for measuring and determining straightness errors with a laser interferometer

- Characteristics of thermal deformation of CNC machines and the impact of temperature on work accuracy

- New methods for checking machine tool accuracy

- Accuracy assessment of 5-axis CNC machine tools

Lab:

1. Measurement and compensation of CNC machine positioning error using a laser interferometer,

2. Measurement and determination of rotational axis positioning errors

3. Measurement of circular interpolation accuracy using the QC-10 Ballbar

4. Measurement of motion and axis straightness using a laser interferomer

Teaching methods

Lecture: multimedia presentation illustrated with examples given on a blackboard.

Laboratory: Practical exercises using modern measuring and diagnostic equipment for machine tools.

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Bibliography

Basic

1. Normy PN-ISO 230-1,2,4. Przepisy badania obrabiarek

2. Normy PN-ISO 10791-3, 4. Warunki badania centrów obróbkowych

3. Instructions for laboratory exercises with a theoretical introduction

Additional

Kosmol J.: Automatyzacja obrabiarek i obróbki skrawaniem, PWN Warszawa, 2000

Breakdown of average student's workload

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

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[1] delete or add other activities as appropriate