POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Diagnostics and supervision of the cutting process [S1MiBM1>DiNPS]

Course

Field of study
Mechanical Engineering

Year/Semester
4/7

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15	15	0

Tutorials	Projects/seminars	
0	0	

Number of credit points

3,00

Coordinators	Lecturers

Prerequisites

The student has basic knowledge of physics, mathematics and mechanics The student is able to use the acquired knowledge and knows how to use information obtained from the library and the Internet The student shows independence in solving problems, acquiring and improving the acquired knowledge and skills, understanding the need to learn

Course objective

Provide students with basic knowledge and skills related to measurement methods, analysis and diagnostic inference. Developing students" skills in solving simple problems and performing independent tasks based on the acquired knowledge

Course-related learning outcomes

Knowledge:
The student has a basic knowledge of metrology; knows and understands methods of measuring physical quantities and analyzing the results
The student has basic knowledge of the operation and diagnostics of technical systems, including the life cycle of devices

Skills:

The student is able to obtain information from literature, databases and other properly selected sources, integrate them, interpret them and draw conclusions, formulate and justify opinions
The student can design simple mechanical structures, electronic and measuring systems
The student is able to plan, carry out standard measurements, analyze, interpret and document the test results; is able to identify and assess the importance of basic factors disturbing the measurement

Social competences:
The student is able to actively engage in solving given problems, independently develop and expand his competences
The student is able to cooperate as part of a team, fulfill the duties entrusted as part of the division of work in a team, demonstrate responsibility for their own work and co-responsibility for the results of the team"s work

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Lecture: Written exam (in the case of answers to: from 50 to 60% of questions - 3.0, over 60 to 70% - 3.5, over 70 to 80% - 4.0, over 80 to 90% - 4.5, over 90 to 100% - 5.0)
Laboratory: Reports on exercises. To obtain credit for the laboratory, the number of absences cannot exceed 1/3 of the classes.

Programme content

LECTURE
1. The essence of diagnostics and supervision of the machining process.
2. Physical phenomena accompanying the process as a source of information about the process.
3. Measurement of physical quantities in terms of automation of the cutting process.
4. Description of monitoring, supervision and automation systems.
5. Inference methods.
6. Designing automation systems for selected operations.
LAB
1. Measurement of the static stiffness of the OUPN system of a universal lathe.
2. Monitoring the condition of the tool wear based on the measurement of forces during turning.
3. Application of spectral analysis to diagnostics of the technical condition of a universal milling machine.
4. Diagnostic inference of the tool wear condition based on the measurement of vibration.
5. Modal analysis of selected components of the OUPN system.

Teaching methods

Lecture: multimedia presentation, discussion
Laboratory: Practical method of realization of production tasks, instruction, discussion, work with a book

Bibliography

Basic
1. Cempel C.: Diagnostyka wibroakustyczna maszyn. PWN Warszawa 1989.
2. Kosmol J., Automatyzacja obrabiarek i obróbki skrawaniem, WNT, 2000
3. Kosmol J.: Monitorowanie ostrza skrawającego. WNT Warszawa 1996.
Additional
1. Olszak W.: Obróbka skrawaniem, WNT Warszawa 2008r.
2. Shaw M.C.: Metal Cutting Principles. Oxford Univ. Press., Oxford 1996.
3. Weck M., Werkzeugmaschinen, VDI-Verlag GmbH, 1982.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	40	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	35	1,50