



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Management of control and measuring equipment

### Course

Field of study

Management and production engineering

Area of study (specialization)

Level of study

Second-cycle studies

Form of study

part-time

Year/Semester

4/8

Profile of study

general academic

Course offered in

Polish

Requirements

elective

### Number of hours

Lecture

8

Laboratory classes

8

Other (e.g. online)

Tutorials

Projects/seminars

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

Bartosz GAPIŃSKI, PhD., DSc. Professor

email: bartosz.gapinski@put.poznan.pl

ph. 61 665 3567

Institute of Mechanical Technology

Faculty of Mechanical Engineering

Piotrowo 3, 60-965 Poznan

Responsible for the course/lecturer:

### Prerequisites

The student should have knowledge of technical metrology, knowledge of manufacturing techniques, quality control, as well as basic knowledge of physics, mechanics, material science and resource management. He/she should demonstrate the ability to think logically, use information obtained from literature (including the Internet) critically. Student understand the need to learn and acquire new knowledge.

### Course objective

Getting to know methods of managing control and measuring equipment. To get familiar with methods



of verifying the correctness of measuring and control equipment. To make the student aware of the role of identification and elimination of faulty measuring and control equipment in modern enterprises.

### Course-related learning outcomes

#### Knowledge

The student knows the basic principles of control and measurement equipment management.

The student knows the basic principles of verifying the correctness of control and measurement equipment operation.

#### Skills

In the basic scope, the student is able to prepare a plan and rules of use and verify the accuracy of control and measuring equipment.

The student is able, to the basic extent, to verify the metrological accuracy of control and measuring equipment and to carry out its adjustment.

#### Social competences

Student understand the need to learn and acquire new knowledge.

Is aware of the importance and understanding of non-technical aspects and effects of engineering activities, including the environmental impact and related responsibility for making decisions.

The student is able to cooperate and work in a group, taking various roles in it.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Pass mark based on a colloquium consisting of scored questions (pass mark if 51% marks:  $\geq 51\%$  (3.0),  $>60\%$  (3.5),  $>70\%$  (4.0),  $>80\%$  (4.5),  $>90\%$  (5.0) ) conducted at the end of the semester.

Laboratory: Credit on the basis of the tasks carried out during the laboratory classes, oral answer on the research work carried out. In order to get a credit for the laboratory, all exercises must be passed successfully. The form and quality of prepared materials (description of issues, results and their analysis) are evaluated.

### Programme content

Lecture:

Control and measuring equipment: definitions, classifications, general division.

Types of measuring and control equipment.

Accuracy requirements for measuring and control equipment.

Principles of verifying the accuracy of measuring and control equipment, including standards and manufacturers' guidelines.



Principles of operation of control and measuring equipment.

Laboratory:

Verification of the accuracy of gauge blocks.

Verification of accuracy of caliper devices.

Verification of the accuracy of micrometers.

Verification of the accuracy of digital altimeters.

### Teaching methods

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

Laboratory: practical exercises, team work

### Bibliography

Basic

Jakubiec W., Malinowski J.: Metrologia wielkości geometrycznych, WNT, Warszawa, 2006

Woźniak A., Ratajczyk E.: Współrzędnościowe systemy pomiarowe, OWPW Warszawa, 2016

Majda P., Zator S., Jakubiec W.: Metrologia, PWE, 2018

Additional

Pająk E.; Zarządzanie produkcją. Produkt, technologia, organizacja. Wydawnictwo Naukowe PWN Warszawa 2006

Durlik I. , Inżynieria zarządzania. Strategia i projektowanie systemów produkcyjnych. Część 1, Agencja Wydawnicza Placet, Warszawa 2000

### 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 laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	30	1,0

<sup>1</sup> delete or add other activities as appropriate