



Course title: Workshop metrology

ECTS credit allocation (and other scores): 2

Semester: autumn

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Engineering and technology

Language: English

Number of hours per semester: 15+15

Course coordinator/ Department and e-mail: Maciej Neugebauer, Department of Electrical, Power, Electronic and Control Engineering, mak@uwm.edu.pl

Type of classes: classes and lectures

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#### Substantive content

**CLASSES:** General rules for the use of control and measurement devices. Caliper measuring instruments. Gauge tiles. Measuring micrometric instruments and sensors - construction, control, regulation and rules of taking measurements. Measurements of internal and external dimensions with caliper and micrometric devices. Indirect measurements using an optometer. Measurements of angular dimensions. End angle patterns. Levels. Surface roughness and waviness control. Measurements of deviations of straightness, flatness, roundness and cylindricity. Screw measurements. Gear wheel measurements.

**LECTURES:** Classification of measuring instruments and measures. Standards of measurement in the measurements of length and angle. Caliper and micrometric measuring instruments. Control of external, internal, mixed and intermediate dimensions. Marking tolerated dimensions. Recommendations for non-tolerated dimensions. Measurements of shape and position deviations. Straightness, flatness, roundness, cylindricity, longitudinal section outline, parallelism deviations. Measurements of angular dimensions. Control of surface roughness and waviness. Screw inspection.

**Learning purpose:** Provision of knowledge on the measurement of geometric dimensions.

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On completion of the study programme the graduate will gain:

**Knowledge:** in metrology useful for formulating and solving simple measurement tasks and tolerating machine part.

**Skills:** Can assess the usefulness of routine methods and tools for solving a simple engineering task.

**Social Competencies:** Can interact and work in a group, assuming different roles in it.

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**Basic literature:** C.L. Dotson, Fundamentals of Dimensional Metrology, Cengage Learning, Inc, 2015; J.P. Hadiya, Mechanical measurement and metrology, Books India Publications, 2020

**Supplementary literature:**

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The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 32

Student's independent work: 20