Study program: Mechanical Engineering

Type and level of studies: Bachelor Academic Studies

Course unit: Measurements and statistical process control

Lecturers in charge: Fatima Zivic

Language of instruction: English

ECTS: 6

Prerequisites:: None

Semester: Summer Semester

Course unit objective

Students will get acquainted with knowledge and skills related to technical metrology, measurements and statistical process control.

Learning outcomes of course unit

After the course completion, the students will be able to use measuring devices; perform selection of the measurement methodology for specific real cases; apply basic methods for quality control in manufacturing, with special attention to the statistical process control.

Course unit contents

Theoretical classes

Measurement Principles; Technical metrology and quality control methods; metrology fundamentals; industrial metrology; techniques for measurements and control; measuring instruments for: length, mass, angle; surface characterisation; microscopic techniques; the SI system and relevant standards; sampling; measurement errors; statistical evaluation of results; statistical process control. Quality control methods: data forms; Control Charts; Benchmarking; SWOT analysis; FMEA analysis.

Practical classes

Laboratory exercises follow the lectures: practical use of measuring devices, reverse engineering devices; surface profilometry, optical techniques; application of statistical analysis in practical cases.

Literature

1. Czichos, H: Introduction to Metrology and Testing, Springer Handbook of Metrology and Testing, 2011.
2. EURAMET (2008), Metrology – in short, http://resource.npl.co.uk/international_office/metrologyinshort.pdf

Number of active teaching hours

Lectures: 30	**Practice:** 45	Other forms of classes:	Independent work:	Other classes:

Teaching methods

Teaching is comprised of lecturing and lab exercises, with independent project for each student.

Examination methods (maximum 100 points)

Exam prerequisites	**No. of points**	**Final exam**	**No. of points**
Student's activity during lectures	**5**	written exam	**30**
practical classes/tests	**40**	oral examination	
Seminars/homework			
Project	**25**		

Grading system

Grade	**No. of points**	**Description**
10	91-100	Excellent
9	81-90	Exceptionally good
8	71-80	Very good
7	61-70	Good
6	51-60	Passing
5	<51	Failing