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
Product quality inspection 1
Course

Field of study	Year/Semester
Product Lifecycle Engineering	1/2
Area of study (specialization)	Profile of study
	general academic
Level of study	Course offered in
Second-cycle studies	English
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
15	30	
Tutorials	Projects/seminars	

Number of credit points
4

Lecturers

Responsible for the course/lecturer:

dr inż. Agnieszka Kujawińska

email: agnieszka.kujawinska@put.poznan.pl

tel. 61 665 27 38

Faculty of Mechanical Engineering

Piotrowo Street No 3, 60-965 Poznań

Responsible for the course/lecturer:

prof. dr hab. inż. Michał Wieczorowski

email: michal.wieczorowski@put.poznan.pl

tel. 61 665 35 67

Faculty of Mechanical Engineering

Piotrowo Street No 3, 60-965 Poznań

Prerequisites

Basic knowledge of technical metrology, technical drawing and machine parts. Basic knowledge of

POZNAN UNIVERSITY OF TECHNOLOGY

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mathematical statistics. The ability to think logically and independently obtain information from various sources, as well as understanding the need for learning.

Course objective

To acquire knowledge about measurement systems used in industry and their correct selection and use and analysis of the data form quality inspection.

Course-related learning outcomes

Knowledge

The student will acquire knowledge in the field of quality inspection and its planning, methods of statistical process control, statistical acceptance inspection and statistical analysis of measurement systems. Classes will cover the theory of using slection methods of measuring systems to evaluate product quality.

Student is able to characterize modern measuremenet systems used in industry. He knows the rules of their construction and technical restrictions. Has knowledge and skills to interpret obtained measurement results.

Skills

Student is able to choose a measuring device and design a measurement strategy adequate to the measuring task. Student is able to determine the sources of measurement errors and eliminate them. Students will be able to: propose the type and form of quality inspection depending on the nature of a process, select a measure of process quality capability, calculate and interpret capability indicies, design and interpret a process control charts, develop a process control plan, plan statistical acceptance control. Student is able to organize the visual inspection station and to choose and use in practice the optical system.

Social competences

The student can work in a group. Student is aware of the need and role of data analysis methods and of modern measuring systems in the economy and the need to constantly expand knowledge.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Credit in writing or oral on the basis of scoring questions (credit in the event of obtaining 51% of points:> 50% - dst,> 60% - dst plus,> 70% - db,> 80% - db plus,> 90% points - very good) carried out at the end of the module.

Laboratory: Credit based on reports from laboratory exercises. To get credit, all exercises must be passed.

Project/Study Visits: Credit based on the evaluation of the completed project presented in the form of a written report and presentation.

Programme content

Classes will be conducted in blocks consisting of lectures and laboratories / projects.

POZNAN UNIVERSITY OF TECHNOLOGY

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Topics of classes:

Quality inspection - its forms and types. Control plan.

Quality process indicies.

Process control charts for features for numerical and alternative evaluation. Special charts.

Statistical acceptance inspection.

Analysis of technical documentation - metrological requirements for tolerances and fits.

Uncertainty estimation for direct and indirect measurement.

Analysis of technical documentation - metrological requirements for GPS (Geometrical Product Specifications).

Measurement of surface asperities - 2D analysis

Measurement of surface asperities - 3D analysis

Coordinate measuring technique - measurements using CMM part 1.

Coordinate measuring technique - measurements with optical scanners part 1.

Teaching methods

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

Laboratory: practical classes

Project: practical classes

Study vistis: As part of the module, two study visits in industrial enterprises are planned. The purpose of the visits is to show in practice the functioning of various forms and types of quality inspection, measurement systems and related data analysis systems.

Bibliography

Basic

1. Handbook of Measurement Science, Vol.1:Theoretical Fundamentals-1982, vol2: Practical Fundamentals, Edited by P.H. Syndenham, 1983.

2. Sładek J., Coordinate Metrology: Accuracy of Systems and Measurements, Springer, 2016.

3. Smith G. M., Statistical Process Control and Quality Improvement, Pearson Prentice Hall, 2004.

4. Montgomery D.C., Introduction to Statistical Quality Control, Jon Wiley&Sons, 2009.

Additional

1. Montgomery D.C., Managing, Controlling, and Improving Quality, Wiely, 2010

POZNAN UNIVERSITY OF TECHNOLOGY

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Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	50	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	50	2,0

1 delete or add other activities as appropriate

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POZNAN UNIVERSITY OF TECHNOLOGY

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pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

5