COURSE DESCRIPTION CARD - SYLLABUS

Course name
Measurement Systems Analysis (MSA)

Course

Field of study
Management and Production Engineering

Year/Semester
2/4

Area of study (specialization)
Production systems

Profile of study
general academic

Level of study
Second-cycle studies

Course offered in
Polish

Form of study
part-time

Requirements
elective

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
8	8	
Tutorials	Projects/seminars	

Number of credit points

2

Lecturers

Responsible for the course/lecturer:
Dr. Magdalena DIERING

email: Magdalena.Diering@put.poznan.pl

ph. +48 616652738

Faculty of Mechanical Engineering

Piotrowo 3, 60-965 Poznan, Poland

Responsible for the course/lecturer:

Prerequisites

Knowledge of issues in the field of quality management, knowledge of the basics of statistical engineering. Student has IT skills - knowledge of MS Office. The student has the skills of logical thinking, the use of information obtained from the library and the Internet. Social competences - the student understands the need to learn and acquire new knowledge; can work in a team; recognizes the possibilities of continuous improvement in various areas of life, including the activities of organizations, with particular emphasis on manufacturing enterprises.

Course objective

To familiarize the student with the methods and procedures of measurement and control systems analysis - MSA.

Course-related learning outcomes

Knowledge

The student knows the statistical properties of measurement systems, knows the basic methods of control and measurement systems study. The student knows what is repeatability and reproducibility, and the level of agreement of the assessments.

Skills

The student knows how to prepare and conduct a study test and interpret the results of the control and measurement system analysis.

Social competences

The student is aware of the effects of engineering activities in both technical and non-technical areas. The student is aware of the effects of decisions and responsibility for decisions.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formulation assessment:

Lecture – Evaluation based on answers to questions about the material discussed in the previous lectures.

Laboratory – Evaluation based on assessment of current progress of tasks

Summary assessment:

Lecture – Examination on the basis of a colloquium consisting of 8 general questions (credit in the case of a correct answer to at least 4 questions (each question for 1 point): 3 points and less – Not credited, 4 - Satisfactory, 5 – Satisfactory plus, 6 - Good, 7 – Good plus and 8 – Very good. Credit – during the last lecture (at the end of the semester). Discussion the results of the exam.

Laboratory exercises: performing a set of tasks during the semester checking the knowledge of selected methods under the MSA, working in a team. Assessment at the end of the semester.

Programme content

Lecture:

1. Quality of measurements and decisions in organization - introduction.

2. The usability of measuring and control devices/instruments.

3. Measurement Systems Analysis (MSA) - essence.

4. The usefulness of the measurement and control system.

5. MSA for measurable features - ARM method.

6. MSA for unmeasurable features - cross tab method.

7. MSA - special cases.

8. Computer support for the analysis of measurement systems.

9. Practical tips for conducting an MSA study in an enterprise.

10. Improving measurement and control systems (Ishikawa diagram for MSA).

Laboratory:

Development of selected elements of MSA procedures in MS Excel.

Teaching methods

Lecture: multimedia presentation illustrated with examples given on the board, discussion.

Laboratory exercises: performing problem tasks, solving tasks, discussion, working in a team.

Bibliography

Basic

1. Measurement System Analysis, 4th ed., Reference manual, AIAG-Work Group, Daimler Chrysler Corporation, Ford Motor Company, General Motors Corporation, 2010.

Additional

1. Kilem Li Gwet, Handbook of Inter-Rater Reliability. The Definitive Guide to Measuring the Extent of Agreement Among Multiple Raters, 4th ed., 2014.

2. Adam Hamrol, Strategie i praktyki sprawnego działania, Wyd. PWN, Warszawa 2015.

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) [1]	30	1,0

[1] delete or add other activities as appropriate