MG2010 Modern Industrial Metrology 6.0 credits

Modern industriell mätteknik

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Technology

Specific prerequisites

Master students of any program with basic knowledge of manufacturing technology (e.g. MG1000, MG1001, MG1006, MG1026, MG2104 or corresponding)

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

On completion of the course you should be able to:

· use different measurement instruments and understand their limitations.

· use statistical methods for treating measurement data.

· explain in own words optical principles such as imaging and illumination.

· explain how mechanical tolerances in drawings and models are used in the measurement process

· in the field of image processing:

- extract feature locations in simple images

- understand the error sources

· in measurement planning field:

- explain the vital steps in the proces

- understand the importance of keeping the cost of poor quality low

· develop algorithms for separating geometrical shapes (errors) in a metrology tool with shapes of the artifact measured without using external references.

Course contents

The role of metrology in the production process

Using statistics for the purpose of treatment of measurement data

How tolerances are connected to measurements of parts

Mechanical and optical systems for measurement of shape and texture of surfaces

Vision systems and image processing

Calibration and self-calibration of geometrical shapes in two dimensions

Development of algorithms in Matlab

Disposition

Practical laboratory exercises where measurement equipment is used, introductory and reflecting lectures. Homework assignments.

Course literature

Will be provided to registered course participants through the LMS.

Examination

- TEN1 - Written Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Exercises and Preparation, 3.0 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

TENA - Examination, 3 credits, grading scale A-F

LAB1 - Laboratory exercises with preparatory work, 3 credits, grading scale P/F

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.