

Course

MT - Measurement Technology

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^ General information

Long name	Measurement Technology
Approving CModule	MT_BaET , MT_BaTIN
Responsible	Prof. Dr. Michael Silverberg Professor Fakultät IME
Level	Bachelor
Semester in the year	summer semester
Duration	Semester
Hours in self-study	60
ECTS	5
Professors	Prof. Dr. Michael Silverberg Professor Fakultät IME
Requirements	MA1, MA2, GE1, GE2
Language	German
Separate final exam	Yes

Final exam

Details

Written module examination

Minimum standard

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Exam Type

Written module examination

^ Lecture / Exercises

Learning goals

Knowledge

General considerations
Historical review
The SI system
Measurement techniques

Known systematic measurement deviations
Unknown systematic measurement deviations
Reproduction of systematic measurement errors
Random measurement errors
Complete measurement result

Random experiments
Relative frequency
The Laplace Experiment
Conditional probability
Independent events

Random variable
Distribution function and distribution density function
Expected value, variance and standard deviation
Central limit theorem, normal distribution and uniform Distribution
Sample of a measurand
Confidence interval for the expected value
Propagation of random deviations
Linear Regression

Properties of electrical measuring instruments
Moving-coil movement
Electrodynamic movement
Moving iron movement
Measuring range extension for DC voltage measurement
Measuring range extension for direct current measurement
Limiters
Alternating current and alternating voltage measurement

Sampling and reconstruction
A/D and D/A converters
Digital Multimeter
Logical basic gates
Memory elements and counters
Digital timing measurement

Digital frequency measurement

Digital Oscilloscopes

Resistance determination

Measuring bridges

Sensors supplying voltage and current

Resistive sensors

Pulsed sensors

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	2
Exercises (whole course)	2
Exercises (shared course)	0
Tutorial (voluntary)	0

Separate exam

none

^ Practical training

Learning goals

Knowledge

Understanding and using digital oscilloscopes

Analyzing of limiter circuits

Analysis of galvanic, magnetic and capacitive couplings

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Practical training	1

Separate exam

none