Technology
Arts Sciences
TH Köln

Course Manual SMV

Sensors and evaluation of measurements

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General information

Long name	Sensors and evaluation of measurements
Approving CModule	SM_BaET
Responsible	Prof. Dr. Johanna May Professor Fakultät IME
Valid from	summer semester 2023
Level	Bachelor
Semester in the year	summer semester
Duration	Semester
Hours in self-study	60
ECTS	5
Professors	Prof. Dr. Johanna May Professor Fakultät IME
Requirements	Fundamentals of electrical engineering, electrical measurement technology, higher mathematics, programming
Language	German, English if necessary
Separate final exam	Yes

Literature

Parthier „Messtechnik“, Vieweg + Teubner, 6. Auflage, 2011 → e-book

Hering, Schönfelder „Sensoren in Wissenschaft und Technik“, Vieweg + Teubner, 2012

Niebuhr, Lindner „Physikalische Messtechnik mit Sensoren“, Oldenbourg, 6. Auflage, 2011

Regtien „Sensors for Mechatronics“, Elsevier, 2012

Hesse, Schnell, „Sensoren für die Prozess- und Fabrikautomation“, 4. Aufl., Vieweg+Teubner, 2009 → e-book

Werner, „Digitale Signalverarbeitung mit MATLAB“, Vieweg+Teubner, 2012 → e-book

Final exam

Details	50% project report and presentation 50% exam
Minimum standard	project: at least solved 50% of task exam: at least reached 50% of points
Exam Type	EN andere summarische Prüfungsform

− Lecture / Exercises

Learning goals

Goal type	Description
Knowledge	temperature sensors, strain sensors, capacitive sensors, piezo sensors, pressure and flow sensors, magnet sensors (Hall, AMR, GMR, TMR), optical sensors, sensor systems, lambda sensor, microsystems, measurement signals, time discrete signals, measurement value transfer systems, discrete Fourier transform, short term spectral analysis, window functions
Skills	Evaluation of sensors with the aid of characteristic curves and characteristic parameters especially regarding sensitivity, cross sensitivity, accuracy, resolution

Special requirements

none

Accompanying material	manuscript, slides
Separate exam	No

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	2
Exercises (whole course)	1
Exercises (shared course)	1
Tutorial (voluntary)	2

− Practical training

Learning goals

Goal type	Description
Skills	Determine characteristic curves of certain sensors, develop measurement scenario, evaluate values and present all lab results as project

Special requirements

none

Accompanying material	instructions, safety instructions
Separate exam	No

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Practical training	1
Tutorial (voluntary)	2