Course Handbook Electrical Engineering

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Electrical Engineering - mandatory courses (overview)

Module name (EN)	Code	Semester	Hours per semester week / Teaching method	ECTS	Module convenor
Bachelor-Thesis	E1702	7	-	12	N.N.
Colloquium	E1703	7	2V	3	N.N.
Digital Signal Processing with FPGA Implementation	E1514	5	3V+1U	5	Prof. Dr. Martin Buchholz
Embedded Systems	E1610	6	4V	5	Prof. Dr.-Ing. Jürgen Schäfer
Laboratory Work Communications Technology	E1612	6	1V+4P	6	Prof. Dr. Horst Wieker
Laboratory Work Micro-Electronics and Telecommunications	E1617	6	6P	6	Prof. Dr. Volker Schmitt
Laboratory Work Radio Frequency Engineering	E1613	6	6P	6	Prof. Dr. Martin Buchholz
Matlab-Simulink in the Information Technology	E1417	4	2V	3	Prof. Dr. Martin Buchholz
lndustrial Placement / Internship	E1701	7	-	14	N.N.

(9 modules)

Electrical Engineering - optional courses (overview)

Module name (EN)	Code	Semester	Hours per semester week / Teaching method	ECTS	Module convenor
Systems Engineering	E1572	-	2PA	3	Prof. Dr. Martin Buchholz
Technical Documentation	E1580	-	2V	2	Prof. Dr. Walter Calles

(2 modules)

Electrical Engineering - mandatory courses

Bachelor-Thesis

Module name (EN): Bachelor-Thesis
Degree programme: Electrical Engineering, Bachelor, ASPO 01.10.2012
Module code: E1702
Hours per semester week / Teaching method: -
ECTS credits: 12
Semester: 7
Mandatory course: yes
Language of instruction: English/German
Required academic prerequisites (ASPO): E1701
Assessment: Thesis
Curricular relevance: E1702 Electrical Engineering, Bachelor, ASPO 01.10.2012, semester 7, mandatory course
Workload: The total student study time for this course is 360 hours.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module convenor: N.N.

Lecturer: N.N.
[*updated 10.02.2013*]

Learning outcomes:
Independently working on a project from research and development. By writing the thesis the student shows that he is capable of dealing with an application-oriented problem from his professional field.
He shows that he is able to work on the problem independently and can present it successfully in a structured way and with engineering methods in a certain amount of time.
[*updated 14.07.2016*]

Module content:
The thesis should be written in cooperation with a cooperating company or within the context of a research project. It should show the students knowledge which he gained during his studies by working on a concrete and application-oriented problem. The limit of the thesis is in principle 3 months maximum. If the supervisor agrees, it can be written in another language than German.
[*updated 14.07.2016*]

Recommended or required reading:
[*still undocumented*]

Colloquium

Module name (EN): Colloquium
Degree programme: Electrical Engineering, Bachelor, ASPO 01.10.2012
Module code: E1703
Hours per semester week / Teaching method: 2V (2 hours per week)
ECTS credits: 3
Semester: 7
Mandatory course: yes
Language of instruction: English/German
Assessment: Presentation
Curricular relevance: E1703 Electrical Engineering, Bachelor, ASPO 01.10.2012, semester 7, mandatory course
Workload: 30 class contact hours over a 15-week period. The total student study time is 90 hours (equivalent to 3 ECTS credits). There are therefore 60 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module convenor: N.N.

Lecturer: N.N.
[*updated 10.02.2013*]

Learning outcomes:
The student can present and discuss the topic of his bachelor thesis within the context of the colloquium in a certain amount of time.
[*updated 14.07.2016*]

Module content:
[*still undocumented*]

Recommended or required reading:
[*still undocumented*]

Digital Signal Processing with FPGA Implementation

Module name (EN): Digital Signal Processing with FPGA Implementation
Degree programme: Electrical Engineering, Bachelor, ASPO 01.10.2012
Module code: E1514
Hours per semester week / Teaching method: 3V+1U (4 hours per week)
ECTS credits: 5
Semester: 5
Mandatory course: yes
Language of instruction: German
Assessment:
Curricular relevance: E1514 Electrical Engineering, Bachelor, ASPO 01.10.2012, semester 5, mandatory course
Workload: 60 class contact hours over a 15-week period. The total student study time is 150 hours (equivalent to 5 ECTS credits). There are therefore 90 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): E1105 E1410 [*updated 14.07.2016*]
Recommended as prerequisite for: E1611 [*updated 05.05.2013*]
Module convenor: Prof. Dr. Martin Buchholz

Lecturer:
Prof. Dr. Martin Buchholz
[*updated 14.07.2016*]

Learning outcomes:
The students:
- learn how to carry out digital signal processing and analysis of telecommunication signals and systems
- know different structures of discrete-time systems and is able to examine them analytically by using the discrete Fourier transform and z-transform
- know how to develop digital, recursive and non-recursive filters, when confronted with a certain filter specification
- learn to simulate and implement digital algorithms in FPGAs (Field Programmable Gate Arrays)
- learn to implement Digital Algorithms into Field Programmable Gate Arrays (FPGA) using SPW/Synopsys and Vivado/XILINX
- know the design flow of real-time implementation of digital algorithms
[*updated 14.07.2016*]

Module content:
1. Introduction, motivation
2. Basis
ideal and real sampling, sampling theorem, practical considerations of sampling
3. Discrete-time signals and systems
discrete convolution, FIR and IIR systems
4. Structures of discrete-time systems
5. Depiction of discrete-time signals and systems in the frequency spectrum
6. The z-transform
7. Design of recursive, digital filters
8. Design of non-recursive, digital filters
9. Model-based FPGA implementation of digital algorithms
Examples and practical work are available for all chapters
[*updated 14.07.2016*]

Recommended or required reading:
Brigham, E.O.: FFT Anwendungen, Oldenbourg, 1997 Goetz, H.: Einführung in die digitale Signalverarbeitung, Teubner, 1998 Hoffmann, J.; Quint F.: Signalverarbeitung mit Matlab und Simulink, Oldenbourg, 2007 Kammeyer, K.-D.; Kroschel K.: Digitale Signalverarbeitung Filterung und Spektralanalys, Teubner Oppenheim, A. V.; Schafer, R. W.: Zeitdiskrete Signalverarbeitung, Oldenbourg, 1999 Stearns, S.D.; Hush D.R.: Digitale Verarbeitung analoger Signale, Oldenbourg, 1999 von Grünigen, D. Ch.: Digitale Signalverarbeitung, Carl Hanser, 2004 Werner, M.: Digitale Signalverarbeitung mit Matlab, Intensivkurs mit 16 Versuchen, Vieweg, 2006
[*updated 14.07.2016*]

Embedded Systems

Module name (EN): Embedded Systems
Degree programme: Electrical Engineering, Bachelor, ASPO 01.10.2012
Module code: E1610
Hours per semester week / Teaching method: 4V (4 hours per week)
ECTS credits: 5
Semester: 6
Mandatory course: yes
Language of instruction: German
Assessment: Written exam
Curricular relevance: E1610 Electrical Engineering, Bachelor, ASPO 01.10.2012, semester 6, mandatory course
Workload: 60 class contact hours over a 15-week period. The total student study time is 150 hours (equivalent to 5 ECTS credits). There are therefore 90 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): E1305 E1501 [*updated 14.07.2016*]
Recommended as prerequisite for:
Module convenor: Prof. Dr.-Ing. Jürgen Schäfer

Lecturer:
Prof. Dr.-Ing. Jürgen Schäfer
[*updated 14.07.2016*]

Learning outcomes:
Knowledge: Construction of components of embedded systems, system-on-chip, peculiarities when programming embedded systems (cross compiler, programming, debugging; interfaces GPIO, ADC, DAC, SPI, I2C, USART; interrupts and exceptions)

Skills: Handling development tools for embedded systems, working with the documentation of a modern RISC-microcontroller and configuring of GPIOs, UASRT-interfaces and timers, creating of interrupt programs, error search in embedded systems.

Competence: programming of microcontroller-based embedded systems with limited resources under real time conditions without operating system. Implementing basic hardware abstractions and the realization of basic controllers by using finite-state machines. Recognition of possible race-conditions.
[*updated 14.07.2016*]

Module content:
Content:
1. Tools for software building
- development environmentµVison (MDK-ARM)
Project settings
Compiler, Linker -- Debugging
-Important support programs
-- TortoiseSVN -- Doxygen
2. Important design patterns
3. Concurrency
- Problems
- Possible solutions
4. Abstraction of the hardware (HAL)
5. Applications in practice
- IO-Pins: Input and output
- Abstract implementation of a communication interface by using the example of an interface for receiving and sending data via an asynchronous (USART) and synchronous (SPI or I2C) serial interface
- Using callback-functions in connection with interrupts (Inversion of Control)
- Time control via timer, PWM generation and analysis
[*updated 14.07.2016*]

Teaching methods/Media:
PC, blackboard, projector
[*updated 14.07.2016*]

Recommended or required reading:
Jospeh Yiu: "The Definite Guide to the ARM Cortex-M3", Newnes Bruce P. Douglass: "Design Patterns for Embeddd Systems in C", Newnes Daniel W. Lewis: "Fundamentals of Embedded Software with the ARM Cortex-M3", Pearson International Ed. Thomas Eißenlöffel: "Embedded-Software entwickeln", dpunkt.verlag J. A. Langbridge: Professional Embedded ARM Development, John Wiley & Sons, 2014 W. Hohl: "ARM Assembly Language - Fundamentals and Techniques", CRC Press, 2009 ST: "RM0008 Reference Manual", www.st.com ARM: "ARM Compiler toolchain, Compiler Reference", http://infocenter.arm.com/help ARM: "ARM Compiler toolchain, Usiong the Compiler", http://infocenter.arm.com/help
[*updated 14.07.2016*]

Laboratory Work Communications Technology

Module name (EN): Laboratory Work Communications Technology
Degree programme: Electrical Engineering, Bachelor, ASPO 01.10.2012
Module code: E1612
Hours per semester week / Teaching method: 1V+4P (5 hours per week)
ECTS credits: 6
Semester: 6
Mandatory course: yes
Language of instruction: English/German
Assessment: Oral exam (50%) and documentation (50%)
Curricular relevance: E1612 Electrical Engineering, Bachelor, ASPO 01.10.2012, semester 6, mandatory course
Workload: 75 class contact hours over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 105 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): E1411 E1516 [*updated 14.07.2016*]
Recommended as prerequisite for:
Module convenor: Prof. Dr. Horst Wieker

Lecturer:
Prof. Dr. Horst Wieker
Dipl.-Ing. Harald Krauss
[*updated 14.07.2016*]

Learning outcomes:
The students
-learn how to handle standard interfaces and protocol analyzer in telecommunications in practical work on real devices
-learn how to handle and analyze network systems (packet switched, circuit switched)
-program routers and switches in IP networks
[*updated 14.07.2016*]

Module content:
1. Protocol analyzing in different systems (narrowband, IP networks)
2. TNM seminars in SDH and IP networks
3. Configuring and programming of routers in IP networks, inclusive troubleshooting
[*updated 14.07.2016*]

Teaching methods/Media:
projector, blackboard, practical work on real network elements and networks
[*updated 14.07.2016*]

Recommended or required reading:
Barz, H.W.: Kommunikation und Computernetze, Carl Hanser, 1995 Etschberger, K.: Controller-Area-Network, Hanser Lienemann, G: TCP-IP-Grundlagen, Heise Perlman, R.: Bridges, router, switches und Internetworking-Protokolle, Addison-Wesley Sikora, A.: Wireless LAN, Addison-Wesley
[*updated 14.07.2016*]

Laboratory Work Micro-Electronics and Telecommunications

Module name (EN): Laboratory Work Micro-Electronics and Telecommunications
Degree programme: Electrical Engineering, Bachelor, ASPO 01.10.2012
Module code: E1617
Hours per semester week / Teaching method: 6P (6 hours per week)
ECTS credits: 6
Semester: 6
Mandatory course: yes
Language of instruction: English/German
Assessment: project work (67%) and project documentation (5 laboratory experiments which accompany the studies) (33%)
Curricular relevance: E1617 Electrical Engineering, Bachelor, ASPO 01.10.2012, semester 6, mandatory course
Workload: 90 class contact hours over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 90 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): E1303 E1402 [*updated 14.07.2016*]
Recommended as prerequisite for:
Module convenor: Prof. Dr. Volker Schmitt

Lecturer:
Prof. Dr. Albrecht Kunz
Prof. Dr. Volker Schmitt
[*updated 14.07.2016*]

Learning outcomes:
The students
-have a broad knowledge of microelectronics and telecommunications, which is complemented by the latest developments
- have learned how to simulate complex circuits and systems on the basis of practice-oriented problems by using commercially available simulation software, like e.g. Matlab and PSpice
-can process the gained simulation results graphically, to interpret and assess them, to find perfect solutions before implementing them technically
-have improved their social and communicative competence by working in a team and presenting their solutions in front of their team in the laboratory
[*updated 14.07.2016*]

Module content:
1. Introduction to the simulation technique by using the simulation tools Matlab / company MathWorks and PSpice / company OrCad
2. Analogue and digital modulation: Comparison of measurements with simulation
3. Design of HF amplifiers
4. Applications and simulations of PLL systems
5. Project work: sending and receiving of optical message signals
[*updated 14.07.2016*]

Recommended or required reading:
Best, Roland: Phase-locked Loops, Design, Simulation and Applications, McGraw-Hill, 2007 Brückner, V.: Optische Nachrichtentechnik, Grundlagen und Anwendungen, Vieweg Verlag Hayward, W. H.: Introduction to Radio Frequency Design, Amer Radio Relay League Lee, Thomas H.: The Design of CMOS Radio-Frequency Integrated Circuits, Cambridge University Press, 2003 Mandl, Mathew: Principles of Electronic Communications, Prentice-Hall Misra, Devendra K.: Radio-Frequency and Microwave Communication Circuits, Analysis and Design, Wiley, 2001 Pozar, David M.: Microwave and RF Design of Wireless Systems, John Wiley & Sons Rutledge, David B.: The Electronics of Radio, Cambridge University Press Stephens, Donald R.: Phase-Locked Loops for Wireless Communications, Kluwer Academic Publishers
[*updated 14.07.2016*]

Laboratory Work Radio Frequency Engineering

Module name (EN): Laboratory Work Radio Frequency Engineering
Degree programme: Electrical Engineering, Bachelor, ASPO 01.10.2012
Module code: E1613
Hours per semester week / Teaching method: 6P (6 hours per week)
ECTS credits: 6
Semester: 6
Mandatory course: yes
Language of instruction: English/German
Assessment: Oral exam
Curricular relevance: E1613 Electrical Engineering, Bachelor, ASPO 01.10.2012, semester 6, mandatory course
Workload: 90 class contact hours over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 90 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): E1517 E1518 [*updated 14.07.2016*]
Recommended as prerequisite for:
Module convenor: Prof. Dr. Martin Buchholz

Lecturer:
Prof. Dr. Martin Buchholz
[*updated 14.07.2016*]

Learning outcomes:
After finishing the combined lecture and laboratory work module the students
-have deepened his radio frequency engineering knowledge
-can calculate and verify complex analogue and digital transmission systems
-know the latest applications of the wired and wireless transmission technologies of the latest transmission standards.
[*updated 14.07.2016*]

Module content:
1. Noise figure and sensitivity of a RF receiver
2. Linear and non-linear signal distortion
3. Frequency multipliers
4. Modulation and demodulation for analogue and digital modulation schemes
5. Receiver architectures
Laboratory experiments:
1. Interferometry: Measurements on an optical fibre by using an optical interferometer
2. Eye pattern: Interpretation of an eye pattern on a 2,5 Gbit/s transmission
3. Spectrum analyzer: Measurement of spectra of modulated signals
4. Network analyzer I: Measurement of S-parameters of passive components
5. Network analyzer II: Measurement of S-parameters of active RF-components
6. Simulation of RF-components and systems with an EDA program
7. Antennas: Measurement of the 3-dimensional radiation pattern
8. Image signal processing: Application of different filter operators
9. Wave propagation: Use of a planning tool for the optimization of digital radio systems
10. Implementation of digital algorithms of the receiver technology in hardware
[*updated 14.07.2016*]

Teaching methods/Media:
Lecture notes, projector, laboratory
[*updated 14.07.2016*]

Recommended or required reading:
Hiebel, M.: Grundlagen der vektoriellen Netzwerkanalyse, Rohde & Schwarz, 2006 Mäusl, R; Göbel, J.: Analoge und digitale Modulationsverfahren - Basisband und Trägermodulation, Hüthig, 2002 Pehl, Erich: Digitale und analoge Nachrichtenübertragung, Hüthig, 2001 Rauscher, Ch.: Grundlagen der Spektrumanalyse, Rohde & Schwarz, 2007 Razavi, B.: RF Microelectronics, Prentice Hall, 1997 Thumm, M.; Wiesbeck, W; Kern, S.:: Hochfrequenzmesstechnik - Verfahren und Messsysteme, Teubner, 1998
[*updated 14.07.2016*]

Matlab-Simulink in the Information Technology

Module name (EN): Matlab-Simulink in the Information Technology
Degree programme: Electrical Engineering, Bachelor, ASPO 01.10.2012
Module code: E1417
Hours per semester week / Teaching method: 2V (2 hours per week)
ECTS credits: 3
Semester: 4
Mandatory course: yes
Language of instruction: English/German
Assessment: Project work
Curricular relevance: E1417 Electrical Engineering, Bachelor, ASPO 01.10.2012, semester 4, mandatory course
Workload: 30 class contact hours over a 15-week period. The total student study time is 90 hours (equivalent to 3 ECTS credits). There are therefore 60 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): E1101 E1201 E1301 [*updated 14.07.2016*]
Recommended as prerequisite for:
Module convenor: Prof. Dr. Martin Buchholz

Lecturer:
Prof. Dr. Martin Buchholz
[*updated 14.07.2016*]

Learning outcomes:
The students learn how to solve mathematical problems numerically and how to simulate systems with MATLAB and Simulink. The acquired theoretical basic knowledge can be applied in information engineering applications and practical projects. On the basis of typical tasks, the students learn how to generate, process and evaluate signals and systems of signal theory and telecommunications. They can process data and depict and analyse simulation results.
[*updated 14.07.2016*]

Module content:
Chapter 0: MATLAB What is it?
Chapter 1: User guidance in MATLAB
Chapter 2: Interactive working with basic elements and functions of MATLAB
Chapter 3: Programming in MATLAB: Scripts and functions
Chapter 4: Graphic
Chapter 5: File operations
Chapter 6: Signal processing with MATLAB
Chapter 7: Symbolic calculating
Chapter 8: Introduction to Simulink
Chapter 9: Signal processing with Simulink
[*updated 14.07.2016*]

Teaching methods/Media:
lecture notes, smart board, PC with MATLAB Classroom Licences
[*updated 14.07.2016*]

Recommended or required reading:
Kammeyer, K.-D.; Kroschel, K.: Digitale Signalverarbeitung, Filterung und Spektralanalyse mit MATLAB Übungen, Teubner Hoffmann, J.; Quint F.: Signalverarbeitung mit MATLAB und Simulink, Anwendungsorientierte Simulationen, Oldenbourg Verlag Bode, H.: MATLAB - Simulink, Analyse und Simulation dynamischer Systeme, Teubner Grupp, F.: Simulink - Grundlagen und Beispiele, Oldenbourg Verlag
[*updated 14.07.2016*]

lndustrial Placement / Internship

Module name (EN): lndustrial Placement / Internship
Degree programme: Electrical Engineering, Bachelor, ASPO 01.10.2012
Module code: E1701
Hours per semester week / Teaching method: -
ECTS credits: 14
Semester: 7
Mandatory course: yes
Language of instruction: English/German
Required academic prerequisites (ASPO): All modules of the semester 1 to 6, at least all modules of the semester 1 to 3 and 45 ECTS from the semester 4 to 6.
Assessment: project work (study accompanying seminar)
Curricular relevance: E1701 Electrical Engineering, Bachelor, ASPO 01.10.2012, semester 7, mandatory course
Workload: The total student study time for this course is 420 hours.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module convenor: N.N.

Lecturer: N.N.
[*updated 10.02.2013*]

Learning outcomes:
The student gained practical experience from the real professional field of his sought degree. He used his theoretical skills, which he gained during his studies in typical engineer work fields, by solving subtasks successfully.
[*updated 14.07.2016*]

Module content:
The student should get to know work areas and fields of graduates of his studies and engineers during a 3-month coherent time in a company. During this time he should take on tasks more and more independently by using his gained skills and knowledge. The application has priority.
[*updated 14.07.2016*]

Recommended or required reading:
[*still undocumented*]

Electrical Engineering - optional courses

Systems Engineering

Module name (EN): Systems Engineering
Degree programme: Electrical Engineering, Bachelor, ASPO 01.10.2012
Module code: E1572
Hours per semester week / Teaching method: 2PA (2 hours per week)
ECTS credits: 3
Semester: according to optional course list
Mandatory course: no
Language of instruction: English/German
Assessment: Project work
Curricular relevance: E1572 Electrical Engineering, Bachelor, ASPO 01.10.2012, optional course KI583 Computer Science and Communication Systems, Bachelor, ASPO 01.10.2011, optional course, technical KIB-SYSE Computer Science and Communication Systems, Bachelor, ASPO 01.10.2017, optional course, technical MAB.4.2.2.18 Mechanical and Process Engineering, Bachelor, ASPO 01.10.2013, optional course, technical PIBWI34 Applied Informatics, Bachelor, ASPO 01.10.2011, optional course, informatics specific PIB-SYSE Applied Informatics, Bachelor, ASPO 01.10.2017, optional course, technical
Workload: 30 class contact hours over a 15-week period. The total student study time is 90 hours (equivalent to 3 ECTS credits). There are therefore 60 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module convenor:
Prof. Dr. Martin Buchholz

Lecturer:
Prof. Dr. Martin Buchholz
[*updated 14.07.2016*]

Learning outcomes:
The student is able to get correct results when solving an interdisciplinary problem of a complex system by using a methodical approach.
[*updated 14.07.2016*]

Module content:
project work on basis of a concrete, complex task using a methodical approach
- requirement analysis and definition
- system design (calculation, simulation, evaluation)
- system integration
- system verification and validation
- project and risk management
- sustainable development and optimization

[*updated 14.07.2016*]

Teaching methods/Media:
Coaching during the project
[*updated 14.07.2016*]

Recommended or required reading:
Literature matching the project
Specialist journals and data sheets
[*updated 14.07.2016*]

Technical Documentation

Module name (EN): Technical Documentation
Degree programme: Electrical Engineering, Bachelor, ASPO 01.10.2012
Module code: E1580
Hours per semester week / Teaching method: 2V (2 hours per week)
ECTS credits: 2
Semester: according to optional course list
Mandatory course: no
Language of instruction: German
Assessment:
Curricular relevance: BMT1580 Biomedical Engineering, Bachelor, ASPO 01.10.2013, optional course, non-medical/technical E1580 Electrical Engineering, Bachelor, ASPO 01.10.2012, optional course, non-technical KI655 Computer Science and Communication Systems, Bachelor, ASPO 01.10.2011, semester 6, optional course, non-technical KIB-TDOK Computer Science and Communication Systems, Bachelor, ASPO 01.10.2017, semester 6, optional course, non-technical MAB.4.2.1.2 Mechanical and Process Engineering, Bachelor, ASPO 01.10.2013, semester 5, optional course, not informatics specific MST.TDO Mechatronics and Sensor Technology, Bachelor, ASPO 01.10.2012, semester 6, optional course, non-technical PIBWN65 Applied Informatics, Bachelor, ASPO 01.10.2011, semester 5, optional course, not informatics specific PIB-TDOK Applied Informatics, Bachelor, ASPO 01.10.2017, semester 6, optional course, non-technical MST.TDO Mechatronics and Sensor Technology, Bachelor, ASPO 01.10.2011, semester 6, optional course, non-technical

Workload:
30 class contact hours over a 15-week period.
The total student study time is 60 hours (equivalent to 2 ECTS credits).
There are therefore 30 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module convenor:
Prof. Dr. Walter Calles

Lecturer: Prof. Dr. Walter Calles
[*updated 17.10.2014*]

Learning outcomes:
Students will be taught to understand and work with technical documents. Different types of text will be presented and analysed with respect to their target readership. The course will also address the influence that text layout and design can have and will introduce structures for simple text production. By learning how to document results, experimental data and search information, how to handle citations and internet sources and how to reference them and generate a bibliography, students will be able to generate technical and scientific texts more efficiently.
[*updated 08.05.2008*]

Module content:
1 Text formatting and layout in standards, regulations and laws
2 Rules for technical texts
3 Operating instructions
4 Summaries and descriptions of content
5 Comprehensibility/readability of texts
6 Commercial and business correspondence
7 Note taking, minutes, reports
8 Numbering of divisions and subdivisions in written documents
9 Citation rules
10 Bibliographic references
11 Time management when creating lengthy documents
[*updated 08.05.2008*]

Recommended or required reading:
Lecture notes
[*updated 13.03.2007*]