# Handbook

“Courses at Offenburg University taught in English”

suitable for bachelor’s level students

Winter Semester 2019/20 (Oct 2019 to Feb 2020)

**SUBJECT TO CHANGE**

last update 7 May 2019

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Vice Director of the International Center, Offenburg University, Germany

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## Providers of courses

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<thead>
<tr>
<th>Provider</th>
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<th>Website</th>
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<tr>
<td>B+W</td>
<td>Department of Business and Industrial Engineering (Campus Gengenbach)</td>
<td><a href="https://bw.hs-offenburg.de/en/international/study-in-offenburg/exchange-students">https://bw.hs-offenburg.de/en/international/study-in-offenburg/exchange-students</a></td>
</tr>
<tr>
<td>EMI</td>
<td>Department of Electrical Engineering, Medical Engineering and Information Technology (Campus Offenburg)</td>
<td><a href="https://ei.hs-offenburg.de/en/international">https://ei.hs-offenburg.de/en/international</a></td>
</tr>
<tr>
<td>M+I</td>
<td>Department of Media and Information (Campus Offenburg)</td>
<td><a href="https://mi.hs-offenburg.de/en/nc/international/study-in-offenburg">https://mi.hs-offenburg.de/en/nc/international/study-in-offenburg</a></td>
</tr>
<tr>
<td>M+V</td>
<td>Department of Mechanical and Process Engineering (Campus Offenburg)</td>
<td><a href="https://mv.hs-offenburg.de/en/international">https://mv.hs-offenburg.de/en/international</a></td>
</tr>
<tr>
<td>SZ</td>
<td>Language Center</td>
<td><a href="https://sprachenzentrum.hs-offenburg.de/kursbeschreibungen">https://sprachenzentrum.hs-offenburg.de/kursbeschreibungen</a></td>
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## List of courses

Level: A all, B bachelor’s, M master’s, B+M master’s (for bachelor’s students only with sufficient previous knowledge).

Workload: SWS hours (45 minutes each) of presence per week, C number of credit points according to ECTS

(1 C equivalent to approx. 25 to 30 working hours for average student, 1 semester comprises 30 C as a rule).

Location: Campus Offenburg unless stated otherwise

Elective courses: Subject to minimum attendance

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<td>Automotive Radar</td>
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<td>Business English</td>
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<td>Business English, Advanced</td>
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<td>Chemistry Lab</td>
<td>lab</td>
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<td>M+V</td>
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<tr>
<td>Computer Networks</td>
<td>lecture</td>
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<td>Database Systems and Lab</td>
<td>lecture + lab</td>
<td>A</td>
<td>M+I</td>
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<tr>
<td>Digital Communications with Lab</td>
<td>lecture + lab</td>
<td>A</td>
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<td>Direct Marketing Workshop</td>
<td>seminar</td>
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<tr>
<td>Economics English</td>
<td>lecture</td>
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<tr>
<td>Energy Economics</td>
<td>lecture</td>
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<td>English for Engineers</td>
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<tr>
<td>English for Information Technology Professionals</td>
<td>seminar</td>
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<tr>
<td>English for Media Engineering</td>
<td>seminar</td>
<td>A</td>
<td>SZ</td>
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</table>
English Refresher (B 1)  seminar  A  SZ
Film  seminar + lab  B  M+I
General Business Administration  lecture  B  B+W
German Culture and Society  seminar  A  M+V
Interactive Distributed Applications  lecture  A  M+I
Interactive Media  lecture  B  M+I
Intercultural Leadership  seminar  B  B+W
Intercultural Media Design + IMD Lab  lecture  B  M+I
Managing Complexity  seminar  A  EM  M+V
Materials Engineering Laboratory  lab  B  M+V
Mechanical Process Engineering Lab  lab  B  M+V
Process Control Engineering  lecture  B+M  M+V
Intercultural Leadership  seminar  B  B+W
Quick Response Manufacturing  lecture  B  B+W
Security of Web Applications  lecture + lab  B  M+I
Technical English  seminar  A  SZ
Tools to Manage Environmental Affairs  lecture + seminar  B+M  M+V
Topical Issues and Presentation Skills  seminar  A  SZ
Transport and Forwarding  lecture (+seminar)  B  B+W

For further courses completely or largely taught in English, suitable only for master’s level students, see the websites of the following master’s degree programmes:

- Biotechnology (MBT)
- Communication and Media Engineering (CME)
- Enterprise and IT Security (ENITS)
- Power Data Engineering (PDE)
- Process Engineering (MPE)
course: Analytics Coaching  
course ID: B+W0040W  
level: B  
seminar | 2 SWS, 3 C (ECTS)  
host semester: BW 7 / LH 7 / WI 7  
assessment: RE (oral presentation)  

Lecturer(s):  
Prof. Dr. Mathias Bärtl  

Module:  
BW-31 / LH-28 / WI-26: Wahlpflichtfächer (Electives)  

Teaching and learning language:  
English  

Requirements:  
Successful completion of Statistics foundation course  

Objectives and competences:  
Participants will be able to plan, prepare and execute advanced statistical analyses, and to evaluate their results, in order to gain relevant knowledge from business data and effectively inform both daily operations and strategic planning.  

Contents:  
- Advanced analytical methods (e.g. ANOVA, $\chi^2$-Testing, Clustering, Decision Trees)  
- Performance of advanced statistical analyses  
- Use cases of business data, and their exploration aided by analytics software and a structured analysis process model  

Literature and Downloads:  
course: Direct Marketing Workshop  
course ID: B+W0028W  
level: B  
seminar | 2 SWS, 3 C (ECTS)  
host semester: BW 7 / LH 7 / WI 7  
assessment: HA (homework) and RE (oral presentation)

Lecturer(s):  
Prof. Dr. Andrea Müller

Module:  
BW-31 / LH-28 / WI-26: Wahlpflichtfächer (Electives)

Teaching and learning language:  
English

Requirements:  
Basic understanding of direct marketing

Objectives and competences:  
- Ability to distinguish between the methods and targets of direct marketing  
- Capability to develop suitable concepts of direct marketing for case studies

Contents:  
The course is an introduction to direct-marketing principles and is based on a firm marketing background. It is designed to provide an understanding of how target-group specific, personal and direct communication, promotion and sales are done, as well as which challenges are to be resolved for companies of all industries.  
The first part of the course provides the students with a basic understanding of direct marketing, its main definitions and history of development. The second part focuses on concepts, methods and instruments of direct-marketing activities. The central issues are:  
- Which media are used for initiating and cultivating customer relationships?  
- Are there differences in acceptance and communication quality? Why?  
- What are success criteria for direct-marketing campaigns?  
- Are there cultural differences?  
- How can the success of an action be measured?  
Students will have opportunities to take part in field visits to direct-marketing companies and guest presentations.

Literature and Downloads:  
Provided in class
course: General Business Administration (Allgemeine Betriebswirtschaftslehre)

course ID: B+W0101
level: B
seminar | 4 SWS. 5 C (ECTS)
host semester: BW 1 / LH 1 / WI 1
assessment: K (written exam)

Lecturer(s):
Prof. Dr. Andreas Klasen

Module:
BW-01 / LH-01 / WI-01: Betriebswirtschaftslehre (Business Administration)

Teaching and learning language:
English

Requirements:
-

Objectives and competences:
The purpose of this course is to provide a comprehensive overview of key elements of the business organization, and to competing theories and models of the firm. It will provide a critical perspective on the main functional areas of business and management including strategy and decision making, logistics and production, marketing and sales, as well as accounting and finance. The course aims to build a foundation of knowledge on the different theoretical approaches to management. On completion of the course, the student will be able to understand the evolution of the business organization and management thought, identifying the interconnections between developments in these areas, discuss and compare different models and approaches, and evaluate the significance of contemporary issues in business.

Contents:
- Understanding the business organization
- Strategy and decision making
- Supply chain, logistics and production
- Marketing and sales
- Accounting
- Finance and investment

Literature and Downloads:
course: Intercultural Leadership

course ID: B+W0043W
level: B
seminar | 2 SWS, 3 C (ECTS)
host semester: BW 7 / LH 7 / WI 7
assessment: PA (project work with presentation)

Lecturer(s):
Mr. Siefert (external)

Module:
BW-31 / LH-28 / WI-26: Wahlpflichtfächer (Electives)

Teaching and learning language:
English

Requirements:
Basic understanding of corporate structures and communication

Objectives and competences:
- Having knowledge and a keen sense of leadership situations
- Finding appropriate ways of leadership
- Exercising a successful performance management system

Contents:
This course provides knowledge about the influence of leadership behavior on different corporate situations. The course establishes an understanding of how leadership behavior exerts influence on performance in regards to an international company’s cultural diversity and communication.

- First part:
  - Definition and objectives of leadership management
  - Different leading concepts and leading styles
  - Changes in leadership management models
  - Influence of different cultural backgrounds on companies and corporate culture
  - Influence of a leader’s personality and communication skills on performance in different situations
  - Communication dynamics between manager and staff
- Second part:
  - Different approaches of leadership management in different situations
  - Modeling a performance management system
- Workshop:
  - Analyzing leadership management in different corporate situations
  - Designing performance measures in leadership management
  - Developing a performance management system

Literature and Downloads:
Provided in class
course: Qualitative Methods

course ID: B+W0022W
level: B
seminar | 2 SWS, 3 C (ECTS)
host semester: BW 7 / LH 7 / WI 7
assessment: PA (project work with presentation)

Lecturer(s):
Prof. Dr. Andreas Klasen

Module:
BW-31 / LH-28 / WI-26: Wahlpflichtfächer (Electives)

Teaching and learning language:
English

Requirements:
Maximum 20 participants

Objectives and competences:
The purpose of this course is to equip students to sensitively and critically design, carry out, report, read, and evaluate qualitative research. The module will provide an overview of the principles and practice of qualitative research. Participants will learn to collect data using observation, interview and focus groups, and become familiar with methodologies and methods such as grounded theory. The course has the dual aims of equipping students with both conceptual understandings of current academic debates regarding different methods, and the practical skills to put those methods into practice. It will provide students with a solid understanding of the core methods of qualitative data collection and analysis, as well as critical skills in interpreting and evaluating reports of qualitative studies.

Contents:
- Foundations
- Qualitative and quantitative methods
- Methodology and methods
- Data collection and analysis
- Qualitative methods in a business administration, management and marketing environment

Literature and Downloads:
course: Quick Response Manufacturing  
course ID: B+W0038W  
level: B  
lecture | 2 SWS, 3 C (ECTS)  
host semester: BW 7 / LH 7 / WI 7  
assessment: K (written exam)

Lecturer(s):  
Mr. Florian Schneider (external)

Module:  
BW-31 / LH-28 / WI-26: Wahlpflichtfächer (Electives)

Teaching and learning language:  
English

Requirements:  
-

Objectives and competences:  
Students learn about the special requirements for companies producing „high-mix / low-volume“ products and customer-specific solutions. The key is to understand why those companies use different methods and tools to organize compared to traditional „mass-production“ companies. Learn practical methods & tools to achieve competitive advantage with short lead-times and high flexibility.

Contents:  
Learn about the management-strategy of Harley-Davidson and John Deere and why this strategy is not only suitable for global players but also for thousands of SMEs world-wide producing highly customized products.

- QRM as an alternative to traditional methods of corporate management for manufacturing companies operating in “high-mix / low-volume” environments
- the switch from “mass-production” to “mass-customization”
- "It's about Time" - Why time is a critical success factor
- Introduction of the Manufacturing Critical-path Time (MCT)
- MCT mapping vs. Value Stream Mapping
- Department vs. QRM-cell: What's the difference?
- POLCA: The alternative to KANBAN for MTO manufacturers
- System Dynamics: Why spare capacity is important
- QRM, LEAN SIX SIGMA: How do these strategies fit together?

Literature and Downloads:  
- http://qrm.engr.wisc.edu
course: Transport and Forwarding

course ID: B+W0047W
level: B
lecture | 2 SWS, 3 C (ECTS)
host semester: BW 7 / LH 7 / WI 7
assessment: K (written exam)

Lecturer(s):
Prof. Dr. Ingo Dittrich

Module:
BW-31 / LH-28 / WI-26: Wahlpflichtfächer (Electives)

Teaching and learning language:
English

Requirements:
Principles of Logistics

Objectives and competences:
- Have knowledge of the basic technical issues of the different transport modes which are relevant for economic decisions, forms and relevant players in the different transport modes, laws and principles of European transport.
- Be able to understand the interdependences in a transport network, analyze the economic and ecological impacts of decisions concerning the transport modes, analyze how value is created within the transport sector, analyze the choice of strategic decisions in transport services companies.

Contents:
Transport and forwarding companies are an important backbone of the European economy. Moreover a well-planned distribution network can save costs and secure an added value to the customer. At the same time the value of transport is not recognized by most of the customers. The margin of transport companies of all transport modes is low and the circumstances for the staff are often weak. This course is about the functionality of different transport modes and how forwarder and transport companies manage to keep business running. The predominant points of view during the course are those of the loading industry and of a forwarder who organizes transport solutions for companies.

- What are relevant details of all transport modes (technology, law, forms and relevant players)
- What is needed to perform an economic and ecological transport?
- What are relevant future developments?

Literature and Downloads:
Provided in class
course: Automotive Radar

course IDs: MK 8078, EI 7985, EP 7460, EPplus 7500
level: B+M
lecture | 2 SWS, 2 C (ECTS)
host semester: EIM
assessment: K60 (written test 60 minutes)

Lecturer(s):
Prof. Dr.-Ing. Marlene Harter

Module:
electives

Teaching and learning language:
English

Requirements:
• Basic knowledge in signal processing
• Basic knowledge in high-frequency but not strictly required

Objectives and competences:
• Understanding the principle and types of automotive radars
• Being capable to understand the advantages of radar compared to other technologies
• Being capable to know the applications and functions of current and future automotive radar systems

Contents:
Advanced Driver Assistance Systems (ADAS), employing available camera, lidar and radar technology, are in worldwide deployment these days. Up to now about 180 million radar units are worldwide circulating on our roads. Today ADAS are no longer comfort devices anymore, but they have become a safety feature for various AEB-Systems (Automatic Emergency Braking) in cars and trucks worldwide.
• History of automotive radar
• Radar basics: Wave propagation, automotive radar frequencies and regulations, comparison to other technologies
• Radar techniques: Radar principles and components, radar signal modulation, basic radar signal processing, radar system specifications and characteristics
• Principles for angle measurement
• Automotive radar in praxis: Applications and examples of automotive radars, radar sensor vehicle installation, mutual interference of radar sensors
• Future trends in automotive radar

Literature and Downloads:
course: Computer Networks  
course ID: E+I407  
level: B+M  
lecture | 2 SWS, 3 C (ECTS)  
host semester: CME1  
assessment: K60 (written test 60 minutes)

Lecturer(s):  
Prof. Dr. Erwin Mayer

Module:  
CME-03: Communication Networks

Teaching and learning language:  
English

Requirements:  
- Background knowledge in communication and networks  
- General background in computer science

Objectives and competences:  
- Understanding general communication concepts and their practical application  
- Understanding role and implications of a layered communication architecture  
- Obtaining the capability to analyze, organize and maintain IP networks  
- Learning the terminology and methodology to be able to analyze and tune communication systems  
- Identifying typical requirements and problems in network environments and devise adequate solutions (e.g. addressing, error recovery, flow control, routing)  
- Capability to select and adequately use standard network equipment (repeater, hubs, switches, routers...) for given tasks  
- Being capable to interpret data traffic visualized over a network sniffing tool and understand the rationale of the exchanged messages  
- Understanding advanced modulation and coding schemes being used in modern computer networks  
- Competence to understand, design, implement and analyze medium access control (MAC) mechanisms being used in modern computer networks  
- Competence to understand the basics of traffic engineering for the use in modern computer networks  
- Understanding performance issues in network environments and how to avoid performance bottlenecks

Contents:  
- General Communication Concepts  
- OSI and TCP/IP Reference Model  
- Physical Layer  
- Data Link Layer  
- Network Layer  
- Transport Layer  
- Application Layer  
- Performance Analysis

Literature and Downloads:  
- Comer, Droms, Computer Networks and Internets, 6th ed., Addison-Wesley, 2014
course: Digital Communications with Lab

course ID: E+I404
level: B+M
lecture and lab | 3 SWS, 3 C (ECTS)
host semester: CME1
assessment: K60 (written test 60 minutes)

Lecturer(s):
Prof. Dr. Tobias Felhauer

Module:
CME-04: Digital Communications

Teaching and learning language:
English

Requirements:
- Basic knowledge about signal and linear system theory
- Basic knowledge about digital communications
- Experience with MATLAB/Simulink is helpful but not strictly required

Objectives and competences:
- Understanding the structure and basic mechanisms in digital communication systems
- Having the capability to design, implement and optimize digital communication systems for different applications
- Understanding basic digital modulation schemes for baseband and passband transmission
- Being capable to evaluate the performance of digital communication systems
- Having the capability to model and simulate digital communication systems by using MATLAB/Simulink in combination with the communication blocksets.

Contents:
- Introduction - Review:
  General block diagram of a digital communication system, characterisation of signals and systems (periodic signals, transient signals, random signals and noise), linear - system characterisation
- Basics of Digital Communications:
  Pulse code modulation (sampling theorems for lowpass and bandpass signals, quantization, coding and SNR calculations), pulse shaping for optimum transmission (inter-symbol interference (ISI), Nyquist criteria, raised cosine rolloff filtering), filtering for optimum detection (matched filter, correlation)
- Baseband Transmission and Line Coding:
  Binary and multilevel signaling, line codes and spectra (NRZ, RZ, Manchester, CMI, AMI, HDBn, 4B3T etc., general requirements, line codes and applications, power spectra and spectral efficiency of binary line codes)
- Bandpass modulation of Carrier Signals:
  Digital bandpass modulations overview, phase constellation diagram, digital quadrature modulator and demodulator implementation structures, analysis of exemplary digital carrier modulation schemes
- Digital Communication System Analysis and Simulation:
  Eye pattern diagram, bit-error-rate calculation, simulation and optimization of digital communication systems using MATLAB/SIMULINK/communication toolbox (lab course)

Literature and Downloads:
course: Animation

course ID: m.gp-17
level: B
hands-on seminar with team work in studios and labs | - SWS, 10 C (ECTS)
host semester: n/k
assessment: practical work

Lecturer(s):
Prof. Götz Gruner

Module:

Teaching and learning language:
English or mixed German-English

Requirements:
Basic design-oriented courses

Objectives and competences:
Ability to develop and produce a media production, in this case animation, VFX and media art

Contents:
- Screenplay, storyboard, conception of installations and performances
- Production of an animated film or a media art project

Literature and Downloads:
course: Database Systems and Lab

course IDs: M+I401 (lecture) and M+I411 (lab)

level: A
lecture and lab | SWS, 3 + 1 C (ECTS)
host semester: CME1
assessment: K (written test) + practical work + LA (lab report)

Lecturer(s):
Prof. Dr. Volker Sänger / Prof. Dr. Katharina Mehner-Heindl

Module:
CME-21: Internet and Media Technologies

Teaching and learning language:
English

Requirements:
Knowledge in at least one Programming Language

Objectives and competences:
- To understand the importance, the value and the risks of data storage and data management in real world
- To be able to apply the concepts of efficient data management in practice

Contents:
- Intro: database system, data model, database applications
- The relational model: relations and attributes, selection, join, projection
- SQL: schema definition, queries, data manipulation, views, consistency, ACID-principle, SQL-transactions
- Database design: design phases, semantic data modeling, dependencies, normalization, transforming the semantic scheme into a logical scheme
- Database programming: JSP, object-relational mapping, JDBC, stored procedures, trigger
- Object-relational databases: shortcomings of the relational model, SQL-3
- Database administration: RAID, indices, roles and rights
- NoSQL-databases, CAP and BASE

Literature and Downloads:
course: Film

Lecturer(s):
Prof. Dr. Heiner Behring

Module:

Teaching and learning language:
English or mixed German-English

Requirements:
Basic design - oriented courses

Objectives and competences:
Ability to develop and produce a media production, in this case a short movie

Contents:
- Production of a short movie (in team of max 4 students)
- Development and writing of a screenplay
- Arranging and preparation of a media production
- Shooting and post production

Literature and Downloads:
course: Interactive Distributed Applications

course ID: M+I400
level: A
lecture | 4 SWS, 5 C (ECTS)
host semester: CME3
assessment: K90 (written test)

Lecturer(s):
Prof. Dr. Tom Rüdebusch

Module:
CME-20: Interactive Distributed Applications

Teaching and learning language:
English

Requirements:
Familiarity with a procedural programming language

Objectives and competences:
- To understand Internet and World Wide Web technologies
- To be able to create basic interactive applications

Contents:
- user interface basics
- distributed systems basics
- Internet services
- WWW protocol (http)
- WWW server technologies (CGI, PHP)
- WWW client technologies (HTML, CSS, JavaScript)
- WWW applications

Literature and Downloads:
- Shneiderman et al.: Designing the User Interface. Pearson, 2017
- Flanagan: JavaScript. O'Reilly, 2011
- Tatroe, MacIntyre, Lerdorf: Programming PHP. O'Reilly, 2013
- Harold, Means: XML in a Nutshell. O'Reilly, 2004
course: Interactive Media

course ID: M+402
level: B
lecture | 2 SWS, 3 C (ECTS)
host semester: CME1
assessment: K60 (written test)

Lecturer(s):
Prof. Dr. Roland Riempp

Module:
CME-21: Internet and Media Technologies

Teaching and learning language:
English

Requirements:
None

Objectives and competences:
- To be capable of planning and implementing multimedia projects

Contents:
- Design and conception for multimedia projects
- Multimedia platforms
- Creating, editing, and combining multimedia assets
- Creating interactivity by programming
- Advanced techniques of multimedia integration
- Multimedia integration as a team work challenge

Literature and Downloads:
course: Intercultural Media Design + IMD Lab

course IDs: M+I403 (seminar) and M+I404 (lab)
level: B

seminar and laboratory | 2+2 SWS, 3+3 C (ECTS)
host semester: CME1

assessment: HA (project work) + RE (oral presentation) + LA (lab work)

Lecturer(s):
Prof. Daniel Fetzner

Module:
CME-22: Media Design

Teaching and learning language:
English

Requirements:
None

Objectives and competences:
- Participants extend their ability for the audiovisual language of color, form, typography, sound, interactive and audiovisual media with emphasis on intercultural communication
- Commercial, scientific and artistic forms of media communication will be applied to analyse design projects
- Sensibility for interdisciplinary fields of visualisation and sonification will be augmented seminar and laboratory are part of an intercultural team learning process

Contents:
- The students start with a self portrait and a reflection about their personal belongings. They document their daily observations in groups out of five people via different media like text, sound and video

Literature and Downloads:
course: Basic Computer Aided Design (CAD)

course ID: M+V823 (mandatory)
level: B
laboratory | 2 SWS, 3 C (ECTS)
host semester: MA2
assessment: LA (lab report)

Lecturer(s):
Prof. Dr. Christian Wetzel

Module:
MA-06: Dokumentation (Technical Documentation)

Teaching and learning language:
Normally German (“Grundlagen CAD”); English or mixed English-German groups will be organized on demand.

Requirements:
- Interest in interdisciplinary work
- Basic knowledge in designing and dimensioning simple machine elements in accordance with stress, production and material requirements

Objectives and competences:
- Ability to use a common CAD program, have an overview of the areas of use of CAD systems, and to understand the importance of CAD systems for product design and the flow of business information
- Acquisition of basic knowledge of general methods and working techniques for 3D modelling and design of components, assemblies, definition of standard parts and the derivation of production drawings with 3D CAD systems
- Capability to independently model and visualize simple components and assemblies with a CAD system and to generate technical drawings from them

Contents:
- Introduction to working with 3D-CAD systems and system basics: function structure and structure of CAD systems, user interface, view manager, model information
- Basic construction elements and model references: coordinate systems, reference planes and axes
- Sketching and sketching methodology: creation, dimensioning and conditions of sketches
- Modelling and machining of components: profile and rotating bodies, drawn parts, composite bodies, rounding and chamfers, bores and threads, ribs, pattern creation, copying, mirroring and moving of construction elements, surface modelling, model adjustments, use of standard part libraries
- Assembly modelling: installation, replacement and adaptation of components, design of assembly structure, skeleton models, assembly information
- Drawing derivation from the 3D model: drawing settings, derivation of assembly drawings and individual part drawings in accordance with standards, generation of model views, dimensioning, deviations in shape and position, surface details, fits, creation of parts lists

Literature and Downloads:
- Sham Tickoo: PTC Creo Parametric 4.0 for Designers, CADCIM Technologies; e-book, 4th ed. 2017
- Wyndorps P.: 3D-Konstruktion mit Pro/ENGINEER Wildfire 5.0. 5. Auflage, Europa-Lehrmittel Verlag, 2010
course: Chemistry Lab

course ID: M+V681 (mandatory)
level: B
seminar+lab | 1 SWS, 1 C (ECTS)
host semester: ES
assessment: LA (lab reports)

Lecturer(s):
Prof. Dr. habil Wolfgang Bessler

Module:
ES-02: Werkstoffe (Materials)

Teaching and learning language:
English or mixed German-English (in parallel to German-language lab groups “Chemielabor”)

Requirements:
-

Objectives of the course:
The participants have knowledge in the basics of general chemistry. They are familiar with the structure and properties of substances, as well as with the properties of chemical reactions. In particular, they have knowledge of the chemical fundamentals of energy system technology, i.e. chemical energy conversion and chemical energy storage.

Contents:
Basic chemical operations handling of typical laboratory equipment
- Chemical balance
- Solubility product
- Redox reactions
- Reaction speed and homogeneous catalysis
- Preparation of a defined solution by weighing and dilution
- Flame dyeing

Literature and Downloads:
- Chemie; Mortimer, C., Müller, U.; Thieme Verlag, 2007, ISBN 9783134843088
Department of Mechanical and Process Engineering (Campus Offenburg)

course: Energy Economics
course ID: M+V3037 (mandatory)
level: B
lecture and seminar/group work | 4 SWS, 4 C (ECTS)
host semester: PDE1
assessment: K90 (written test 90 minutes)

Lecturer(s):
Prof. Dr.-Ing. Niklas Hartmann

Module:
PDE-01: Energy Economics (Energiewirtschaft)

Teaching and learning language:
English

Requirements:
Good knowledge in Business Administration and basics of Energy Engineering

Objectives and competences:
The students know and apply the common terminology in the energy sector. They know and understand the structure of an energy sector by example of Germany and are able to access systematically the structures of other energy markets. The students know how to access data in the energy sector; they are acquainted to statistical methods allowing critical analysis of data.
The students got the background to judge the impact of actual developments in industry, politics, legacy etc. on the energy sector.
The students know how to gain information and data required for techno-economic analyses of energy projects. They are able to perform cost calculation and investment appraisal studies.
By applying Computer-Algebra-Tools they are able to perform extensive sensitivity analyses.

Contents:
- Terminology in the energy sector
- Primary energy resources:
  conventional and renewable, energy conversion chains
- Environment protection:
  impact of exploitation, transport and conversion on environment, environment protection and international law
- Structure of the energy sector:
  government agencies, organisations, industry, etc. involved and their role; Regulations in the energy sector by example of Germany and Europe; liberalisation in the energy market; regulation of grid-bound energy sector
- Cost calculation; learning curves; investment appraisal methods
- Energy demand and energy systems:
  sectors; daily, weekly and seasonal load profiles; electricity market and heat market; district heating; cogeneration
- Electrical supply:
  example Germany, Europe; power plant fleet; virtual power plants; base load, middle load, peak load; decentralised energy supply; grid topology; grid operation; quality and reliability of grid operation

Literature and Downloads:
course: German Culture and Society

course ID: M+V910 (elective)

teaching language: English

level: A

group: seminar | 2 SWS, 2 C (ECTS)

host semester: MPE1

assessment: RE (oral presentation)

Lecturer(s):

Ms. Zumholz (external)

Module:

MPE-16: Non-Technical Competences

Teaching and learning language:

English

Requirements:

- Only for non-Germans
- Interest and basic knowledge in history, politics, society, in particular with respect to Germany and the Germans

Objectives and competences:

Improving knowledge about and understanding of Germany and the Upper Rhine region and its inhabitants

Contents:

Possible topics:

- Germany: East and West, federal structure, political parties, "social market economy", free democratic basic law, national anthem ("über Alles"?), public and private media (papers, radio, TV, films), education system, present challenges (EU, regional effects of climate change, terrorism, integration of refugees)
- The image of Germany and the Germans in the students' countries of origin
- The tri-national Upper Rhine region: Baden, Alsace, northwestern Switzerland
- Industrialization in Germany, medium-sized enterprises ("mittelständische Unternehmen"), region-based industries and global players ("Herrenknecht", "Tesa", "Daimler", "BASF"), mining in the Black Forest, tourism, winegrowing and beer brewing, media enterprises ("Burdà")
- The revolution in Baden and the Offenburg freedom movement. German emigration to the second and third world, the synod of Konstanz, religion now and then, hierarchical structures
- German language and culture: regional dialects ("badisch", "schwäbisch", "alemannisch", "schwizerdütsch", "plattdeutsch"), humour and political satire as reflecting the zeitgeist ("Heinz Erhardt", "Dieter Hildebrandt", "Loriot"), contemporary music ("Stockhausen", "Udo Lindenberg", "Neue Deutsche Welle", "Guggemusik"), code of conduct ("Knigge")

Literature and Downloads:

- Watson, P.: The German Genius; Simon & Schuster UK, London 2010
- The Federal President - representing and integrating: www.bundespraesident.de/EN/Role-and-Functions/WorkInGermany/RepresentingAndIntegrating/representing-and-integrating.html
- The German revolution 1848 - Frankfurt Vorparlament - German National Assembly: www.age-of-the-sage.org/history/1848/german_revolution.html
- The Hecker uprising (Baden including Offenburg in 1848/49): https://en.wikipedia.org/wiki/Hecker_uprising
- In the heart of Europe - The Upper Rhine Valley (2000): www.regbas.ch/de/assets/Files/downloads/Economy_-_Upper_Rhone_Valley.pdf
- Guide to German culture, customs and etiquette: http://www.uni-frankfurt.de/46329991/Guide-to-German-culture_and-etiquette.pdf
course: Managing Complexity  
course ID: M+V3032 (elective)  
level: A  
seminar | 2 SWS, 2 C (ECTS)  
host semester: CME1 / MPE1 / PDE1  
assessment: HA (written report)

Lecturer(s):  
Dipl. met. Noel C. Spare (external)

Module:  
MPE-16: Non-Technical Competences etc.

Teaching and learning language:  
English

Requirements:  
Willingness to “think different”, spreadsheet competence

Objectives of the course:  
“A course of learning designed as an introduction to a knowledge-based management philosophy”  
The purpose of this course is to introduce a philosophy of management and leadership that is based upon a system of knowledge. Understanding this system requires a unique way of thinking about the interpretation of measurement, about the behaviour of people, about how they learn and about how systems function. Such knowledge is the precursor to organisational change and optimisation characterised by continually improving quality, the minimisation of economic loss, the reduction of cost, sustainable competitiveness, innovation and the restoration of pride in workmanship and joy in work.  
Students will gain an understanding of variation and uncertainty and how it affects the performance of business, commerce and manufacturing. They will gain competence in rational sampling and applied data analysis. They will be able to separate noise and signals in any data set and know how to take appropriate action with the aim of continual improvement and achieving sustainable competitiveness. They will understand the fundamentals of a learning organisation, what influences the way people behave and appreciate how all of this fits into the systemic whole.

Contents:  
The course is designed to provide a fundamental basis for management and leadership in the information age. It will introduce a scientific and philosophical approach to management and explore the historical origins of an analytical methodology that allows profound insight into the behaviour of processes and systems. It will teach that management is prediction and provide an understanding of a methodology for transforming raw data into knowledge in order to secure a sound basis for future action. Case histories will demonstrate how the costly errors of inappropriate action and sub-optimisation can be avoided and how a scientific basis for continual improvement and sustainable competitiveness is achieved.

Literature and Downloads:  
- Spare, N.C.: Managing Complexity - A Compendium of Papers for a System of Knowledge; collection of selected papers  
- Deming, W. Edwards: Out of the Crisis; Massachusetts Institute of Technology 1982 and 1986  
- Deming, W. Edwards: The New Economics; Massachusetts Institute of Technology 1994/95  
- Neave, Henry R.: The Deming Dimension; SPC Press Inc. 1990  
- Wheeler, Donald J.: Understanding Variation - The Key to Managing Chaos; SPC Press Inc. 1993  
course: Materials Engineering Laboratory

course ID: M+V703
level: B
seminar+lab | 3 SWS, 3 C (ECTS)
host semester: MA3
assessment: LA (lab reports)

Lecturer(s):
Prof. Dr. Dipl.-Ing. Dietmar Kohler, Prof. Dr. rer. nat. Johannes Vinke

Module:
MA-16: Schweißtechnik (Welding Technology)

Teaching and learning language:
Normally German (“Labor Schweißtechnik”); on demand English or mixed German-English groups, additional short introductory seminar for non-German speakers who do not participate in the German-only taught lecture “Schweißtechnik” (Welding Technology).

Requirements:
Theoretical knowledge in materials science and in welding techniques.

Objectives of the course:
The students are capable of critically assessing and applying the individual welding and thermal cutting processes, taking into account the design and material specifications.

Contents:
Possible topics in seminar:
- Comparison of plastic and metal materials
- Classification of polymers
- Assembly of polymers: structure and behavior
- Manufacturing polymers: Methods and properties
- Plastic materials: Influence of intermolecular physical bondings; effect of additives
- Mechanical and thermal behavior, heat resistant polymers
- Properties and special processing methods of selected plastic materials

Laboratory tests:
- Identification of thermoplastic materials
- Measurement of tensile strength
- Measurement of melting flow Index
- Measurement of impact resistance

Literature and Downloads:
- lab test instructions
course: Mechanical Process Engineering Lab

course ID: M+V472 (mandatory)
level: B
lab | 2 SWS, 2 C (ECTS)
host semester: MPE1
assessment: LA (lab reports)

Lecturer(s):
n/k

Module:
BT-24 / UV-26: Mechanische Verfahrenstechnik (Mechanical Process Engineering)

Teaching and learning language:
English, in parallel to Process Engineering Lab (in MPE)

Requirements:
Good theoretical knowledge in mechanical process engineering, documented for example by a successful exam

Objectives of the course:
The students' theoretical knowledge is consolidated by means of laboratory tests.

Contents:
Choice of experiments:
- Viscosity measurement
- Particle size reduction and particle size distribution measurement
- Piping technology
- Free fall velocities and settling velocities of particles
- Mixing time measurement in stirred tanks
- Mass transfer rate measurement in stirred tanks
- Scale-up in liquid mixing
- Cake-forming filtration
- Fluidized bed technology

Literature and Downloads:
- Lab test instructions, downloads from university “moodle” course
- EKATO Rühr- und Mischtechnik GmbH; Handbook of Mixing Technology; Schopfheim, 1991
- Mota, M. et al; Effect of real particles packing with large size ratio on porosity and tortuosity of filter bed; Proceedings of 9th World Filtration Congress, New Orleans, USA, 2004
- DIN 53 018, parts 1 and 2; Measurement of the dynamic viscosity of Newtonian Liquids with Rotational Viscometers; Beuth-Verlag, Berlin, 1976 (in German)
- DIN 53 019, part 1; Measurement of Viscosity and Flow Curves with Rotational Viscometers with Standardized Geometry; Beuth-Verlag, Berlin, 1980 (in German)
- DIN ISO 9276-1:2004-09: Representation of results of particle size analysis - Part 1: Graphical representation, Beuth-Verlag (until 2002: DIN 66141) (available in German and English)
- DIN 66145 Graphical representation of particle size distributions; Beuth 2004 (available in German and English)
course: Process Control Engineering

course ID: M+V916 (mandatory)
level: B+M
lecture | 2 SWS, 2 C (ECTS)
host semester: MPE1
assessment: K60 (written test 60 minutes)

Lecturer(s):
Dipl.-Ing. Helmut von Au, Siemens AG, Karlsruhe

Module:
MPE-15: Plant Safety and Control

Teaching and learning language:
English

Requirements:
Bachelor's level in control engineering, knowledge in process engineering

Objectives of the course:
The students are acquainted with the hard- and software of process control systems. They get knowledge about the different fieldbus technologies. The students are able to decide, which control system is best to fulfil a particular task, and how to distinguish between an integrated Process Control System and a PLC with SCADA. They know how a process control system is structured, and they can define a complete loop of measurement and control from sensor to actuator. They are capable of creating and programming an integrated, object orientated control system in a way to start and control a simple process.

Contents:
- The automation pyramid
- Norms and regulations
- The most relevant DCS systems
- Sensors and actuators
- Fieldbus systems
- Controller Level
- DCS Level

Literature and Downloads:
- http://www7.informatik.uni-wuerzburg.de/fileadmin/10030700/user_upload/vorlesungen/ss03/lit_reg_aut_tech.pdf
course: Tools to Manage Environmental Affairs

course ID: M+V911 (elective)  
level: B+M

lecture and seminar | 2 SWS, 2 C (ECTS)

host semester: MPE1

exam: HA+RE (written report and oral presentation)

Lecturer(s):
Dr.-Ing. Wolfgang Winkelbauer, Daimler AG, Rastatt

Module:

MPE-16: Non-Technical Competences

Teaching and learning language:
English

Requirements:
Knowledge of basic unit operations in process engineering, interest in and ability of interdisciplinary thinking

Objectives of the course:
The students understand the relationship between production methods, risk containment, and environmental protection in modern industrialized societies.

Contents:
- Developing the basic attitude, skills and principles of operation, result orientated and activity based indicators to manage environmental affairs, Initiatives and standards
- Managing legal compliance with indicators, threshold compliance with indicators and statutory requirement compliance with indicators
- Environmental risk assessment and ecological evaluation, assessment of production sites, with examples
- Developing a risk assessment questionnaire and an indicator out of it
- Ecology: Evaluation of production sites, influences on ecosystems, biodiversity management, eco account, environmental benchmarking, environmental policy and strategy, enhancement of environmental performance
- Communication: Regular, external and internal; tools, in case of accident, obtain and convert a permit, realization of industrial projects, lobbying

Literature and Downloads:
- Baumbach, G.; Göttlicher, R.; Winkelbauer, W.: Einfluss von Inversionen auf die Schadgasverteilung über einer Kleinstadt im Naturpark Schönbuch (The influence of inversions on the gaseous pollutants dispersion above a small town at the Schönbuch Nature Park); Staub, Reinhaltung der Luft; no. 44, 1985 vol. 7/8, pp. 365-368
- Kärst, H.; Winkelbauer, W.: Das Abfallwirtschaftskonzept Rastatt - Auswahl und Zusammenarbeit mit externen und internen Partnern ….; Umweltwirtschaftsforum vol. 8/2, pp. 16-20
- Federal Immission Control Act (Bundes-Immissionsschutzgesetz, BImSchG), sections 53 to 58d; German Law Archive, http://germanlawarchive.iuscomp.org/?p=315 (in English)
- Federal Water Act (Wasserhaushaltsgesetz, WHG), sections 64 to 66; German Law Archive, http://germanlawarchive.iuscomp.org/?p=526 (in English)
- Closed Substance Cycle Waste Management Act (Kreislaufwirtschafts- und Abfallgesetz, KrW-/AbfG), sections 54 and 55; German Law Archive, http://germanlawarchive.iuscomp.org/?p=303 (in English)
- Global Reporting Initiative, GRI: www.globalreporting.org/standards/Pages/default.aspx
- European Integration Pollution Prevention Control Bureau, EIPPCB: http://eippcb.jrc.ec.europa.eu/reference
course: Business English (campus Gengenbach)

course ID: 
level: A
seminar | 2 SWS, 2 C (ECTS)
host semester: BW
assessment: K60 (written test 60 minutes)

Lecturer(s):
Various (external)

Module:

Teaching and learning language:
English

Requirements:
- Entry level: B 1 (European Language Portfolio)
- Primarily for students of BW at the Department of Business and Industrial Engineering, Campus Gengenbach

Objectives and competences:
- Enriching business vocabulary: phoning, emailing, socializing, negotiations, meetings, presentations
- Increasing ease in communicating in a business environment
- Improving formal writing
- Target level: B 2

Contents:
- Advanced business vocab on business organization, marketing, HR etc.
- Task-based grammar exercises, if needed

Literature and Downloads:
-
course: Advanced Business English (campus Gengenbach)

course ID: 
level: A

seminar | 2 SWS, 2 C (ECTS)

host semester: DEC / BWM / WIM

assessment: K60 (written test 60 minutes)

Lecturer(s):
Various (external)

Module:
-

Teaching and learning language:
English

Requirements:
- Entry level: B 1
- Primarily for students of DEC, BWM and WIM at the Department of Business and Industrial Engineering, Campus Gengenbach

Objectives and competences:
- understand cultural differences and respect rules of diplomacy
- express an opinion in a distinguished diplomatic way / being able to contradict another opinion professionally
- negotiate a deal
- give presentations
- apply for a position (resume writing and job interview practice)
- select information from texts and films in an efficient and comprehensive way
- write short reports and meeting minutes
- Target level: B 2

Contents:
This course covers a range of themes that students of business and technology related workfields will find useful (see content). The focus will be on the training of spoken production and interaction on the basis of listening and reading comprehension examples from current news and economic developments. Grammar and vocabulary skills will be consolidated.
- International Communication
- Intercultural Differences
- Company Structures
- Entrepreneurship
- Job Interviews

Literature and Downloads:
- www.economist.com
- www.bbc.co.uk
Language Center

course: Economics English (campus Gengenbach)

course ID:
level: A
lecture | 4 SWS, 4 C (ECTS)
host semester: BW1 / BW3 / LH1
assessment: K60 (written test 60 minutes) + RE (oral presentation)

Lecturer(s):
Various (external)

Module:
-

Teaching and learning language:
English

Requirements:
• Entry level: B 1
• Primarily for students of BW and LH at the Department of Business and Industrial Engineering, Campus Gengenbach

Objectives and competences:
• Target level: B 2

Contents:
• Enriching business vocabulary: phoning, emailing, socializing, negotiations, meetings, presentations
• Increasing ease in communicating in a business environment
• Improving formal writing

Literature and Downloads:
• Career Express B2, Cornelsen, ISBN 978-3-06-520200-8
course: English for Engineers

course ID: n/k
level: A
Seminar | 2 SWS, 2 C (ECTS)
host semester: -
assessment: K60 (written test 60 minutes)

Lecturer(s):
Various (external)

Module:
-

Teaching and learning language:
English

Requirements:
- Entry level: B 1
- Knowing and applying the most important times, as a rule, correctly
- Knowledge of the most common grammatical rules
- Interest in interactive communication and independent presentation of course content

Objectives and competences:
- Capturing and interpreting information from complex texts
- Giving a short lecture on a current occupational topic
- Writing a clearly structured text on a subject-specific topic
- Participating in a technical debate and presenting one’s opinions
- Target level: B 2

Contents:
- Innovations & trends in the future
- Engineering vocabulary needed in working environment
- Intercultural communication for Engineers
- Successful correspondence

Literature and Downloads:
-
course: English for Information Technology Professionals

Lecturer(s):
Various (external)

Module:
-

Teaching and learning language:
English

Requirements:
- Entry level: B 1

Objectives and competences:
- Prepare the student to recognize basic IT related words and their acronyms
- Know and understand how to write basic technical English sentences and paragraphs
- Be able to communicate in both technical and non-technical settings and situations
- Know and understand how to prepare technical presentations
- Ability to write technical English documentation
- Target level: B 2

Contents:
- Planning and writing written and spoken messages.
- Technical presentations using Power Point
- Vocabulary for systems administration, network technologies, cyber security technologies, and other Information Technology specific topics
- Interactive class projects, videos, and real-world demonstrations

Literature and Downloads:
-
course: English for Media Engineering

course ID: n/k
level: A
seminar | 2 SWS, 2 C (ECTS)
host semester: MI
assessment: RE (oral presentation)

Lecturer(s):
Various (external)

Module:
-

Teaching and learning language:
English

Requirements:
- Entry level: B 1
- Primarily for students in the Department of Department of Media and Information
- Knowing and applying the most important times, as a rule, correctly
- Knowledge of the most common grammatical rules
- Interest in interactive communication and independent presentation of course content

Objectives and competences:
- Ability to design presentations in English language
- Commanding vocabulary in media terminology
- Understanding and application of frequently used expressions of the media world
- Participating in a technical debate and presenting one’s opinions
- Target level: B 2

Contents:
Media-related extracts from the website www.ted.com, such as:
- Innovation and future issues
- Intercultural communication
- Global trends in the media scene

Literature and Downloads:
- www.ted.com
course: English Refresher (B 1)

course ID: n/k
level: A
seminar | 2 SWS, 2 C (ECTS)
host semester: MI
assessment: K60 (written test 60 minutes)

Lecturer(s):
Various (external)

Module:
-

Teaching and learning language:
English

Requirements:
- Entry level: A 2

Objectives and competences:
- Extending vocabulary
- Improved oral skills through speaking and discussion
- Grammatical structures will be revised and built upon
- Improvement of writing, reading and listening skills
- Professional work skills practice
- Target level: B 1

Contents:
- Focus on general English - vocabulary, reading, listening, speaking and writing
- A2 level grammar will be revised and extended for a B1 level
- Professional work skills will also be introduced with a focus on socializing, telephoning, business correspondence, job applications and presentations
- Speaking and discussion topics will be included

Literature and Downloads:
- articles and videos from various sources
course: Technical English (also block courses, also at campus Gengenbach)

course ID: n/k
level: A
seminar | 4 SWS, 4 C (ECTS)
host semester: -
assessment: K90 (written test 90 minutes)

Lecturer(s):
Various (external)

Module:

Teaching and learning language:
English

Requirements:
- Entry level: B 1
- Courses in Gengenbach (weekly and blocks) primarily for students of WI at the Department of Business and Industrial Engineering, Campus Gengenbach
- Courses in Offenburg (weekly and blocks) for all

Objectives and competences:
- Communicating appropriately in typical situations at work
- Building up relevant vocabulary of diverse technical topics
- Understanding the main ideas of complex technical texts
- Describing technical objects, processes and issues
- Target level: B 2

Contents:
In pairs and groups workshops, roleplays, and presentations on topics such as technical functions and applications, materials technology, components and assemblies, technical problems, technical development, renewable energies, etc. as well as functional language that is useful in any branch of engineering (mechanical, electrical, etc.).

Especially in course for WI students: Automotive, mechanical engineering, electrical engineering, renewable energies.

Pharmaceutical English, Project Management

Literature and Downloads:
-
course: Topical Issues and Presentation Skills

course ID: n/k
level: A
seminar | 2 SWS, 2 C (ECTS)
host semester: -
assessment: K60 (written test 60 minutes)

Lecturer(s):
Various (external)

Module:

Teaching and learning language:
English

Requirements:
- German, level B2

Objectives and competences:
- Ability to present statistics and graphs by analysing authentic business materials, and speaking about statistics from your studies
- Improved speaking fluency and accuracy, by reading/hearing opinions on current issues of your interest and then defending your own opinion or a role – played opinion
- Extension of vocabulary through in-depth discussion and reading of articles and exercises

Contents:
Pair and group work, presentations

Literature and Downloads:
-