Handbook
“Courses at Offenburg University taught in English”
Suitable for Bachelor’s Level Students
Winter Semester 2020/21 (Oct 2020 to Feb 2021)
SUBJECT TO CHANGE

Last Update: December 2019

Providers of Courses

**B+W** Department of Business and Industrial Engineering (Campus Gengenbach)
(https://bw.hs-offenburg.de/en/international/study-in-offenburg/exchange-students)

**EMI** Department of Electrical Engineering, Medical Engineering and Computer Science
(Campus Offenburg) (https://ei.hs-offenburg.de/en/international)

**M+I** Department of Media and Information (Campus Offenburg)
(https://mi.hs-offenburg.de/en/nc/international/study-in-offenburg)

**M+V** Department of Mechanical and Process Engineering (Campus Offenburg)
(https://mv.hs-offenburg.de/en/international)

**SZ** Language Center
(https://sprachenzentrum.hs-offenburg.de/en/course-descriptions)

List of Courses

- **Level**: A all, B bachelor’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 or Campus Gengenbach
- **Elective Courses**: Subject to minimum attendance

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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)
## Analytics Coaching

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**Lecturer(s):**
Prof. Dr. Mathias Bärthl

**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:**
Direct Marketing Workshop

Course ID: B+W0028W
Level: Bachelor
Course Type: Seminar
Semester Hours per Week: 2.0
Credits: 3 (ECTS)
Host Semester: BW 7 / LH 7 / WI 7
Examination: PA (Oral Presentation)
Module: BW-31 / LH-28 / WI-26: Wahlpflichtfächer (Electives)
Location: Campus Gengenbach

Lecturer(s):
Prof. Dr. Andrea Müller

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
General Business Administration

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Lecturer(s):
Prof. Dr. Andreas Klasen

Requirements:
None

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:
Intercultural Leadership

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Lecturer(s):
Mr. Siefert (Guest Lecturer)

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
Qualitative Methods

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Lecturer(s):
Prof. Dr. Andreas Klasen

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:
Quick Response Manufacturing

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

Requirements:
None

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
Transport and Forwarding

Course ID: B+W0047W
Level: Bachelor
Course Type: Lecture
Semester Hours per Week: 2.0
Credits: 3 (ECTS)
Host Semester: BW 7 / LH 7 / WI 7
Examination: K (Written Exam)
Module: BW-31 / LH-28 / WI-26: Wahlpflichtfächer (Electives)
Location: Campus Gengenbach

Lecturer(s):
Prof. Dr. Ingo Dittrich

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 interdependencies 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
Automotive Radar

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

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:
Communication Systems Lab

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Lecturer(s):

Prof. Dr.-Ing. Stefan Pfletschinger

Requirements:

• None

Objectives and Competences:

The participants understand the representation and transmission of information by analogue electrical signals. They are able to classify signals and understand basic modulation schemes in theory and practical application.

Contents:

• Lab 1: Diodes for signal limitation
• Lab 2: Amplifier with transistors
• Lab 3: Power amplifier
• Lab 4: Oscillators
• Lab 5: Amplitude modulation
• Lab 6: Frequency modulation

Literature and Downloads:

• Provided in class
Computer Networks

Course ID: E+I407
Level: Bachelor + Master
Course Type: Lecture
Semester Hours per Week: 2.0
Credits: 3 (ECTS)
Host Semester: CME1
Examination: K (Written Exam)
Module: CME-03: Communication Networks
Location: Campus Offenburg

Lecturer(s):
Prof. Dr. Erwin Mayer

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
Digital Communications with Lab

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Lecturer(s): Prof. Dr. Tobias Felhauer

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:
Animation 1 and 2

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<tr>
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Lecturer(s):
Prof. Götz Gruner

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:
- Provided in class
Database Systems and Data Systems Lab

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

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:
- Provided in class
# Film 1 and 2

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**Lecturer(s):**
Prof. Dr. Heiner Behring

**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:**
- Provided in class
Interactive Distributed Applications

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Lecturer(s):

Prof. Dr. Tom Rüdebusch

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
Interactive Media

Course ID: M+I409  
Level: Bachelor  
Course Type: Lecture  
Semester Hours per Week: 2.0  
Credits: 3 (ECTS)  
Host Semester: CME1  
Examination: K (Written Exam)  
Module: CME-21: Internet and Media Technologies  
Location: Campus Offenburg

Lecturer(s):  
Prof. Dr. Roland Riempp

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:  
- Provided in class
Intercultural Media Design + IMD Lab

Course ID: M+I403 (Seminar) and M+I404 (Lab)
Level: Bachelor
Course Type: Seminar and Laboratory
Semester Hours per Week: 2.0 and 2.0
Credits: 3 and 3 (ECTS)
Host Semester: CME1
Examination: HA (Project Work) + RE (Oral Presentation) + LA (Lab Work)
Module: CME-22: Media Design
Location: Campus Offenburg

Lecturer(s):
Prof. Daniel Fetzner / Prof. Dr. Robert Gücker

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:
- Provided in class
Basic Computer Aided Design (CAD)

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Lecturer(s):
Prof. Dr. Christian Wetzel

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
Chemistry Lab

Course ID: M+V681
Level: Bachelor
Course Type: Laboratory
Semester Hours per Week: 1.0
Credits: 1 (ECTS)
Host Semester: N/A
Examination: LA (Lab Report)
Module: ES-02: Werkstoffe (Materials)
Location: Campus Offenburg

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

Requirements:
None

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
Energy Economics

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

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:
German Culture and Society

Course ID: M+V910
Level: All
Course Type: Lecture
Semester Hours per Week: 2.0
Credits: 2 (ECTS)
Host Semester: MPE1
Examination: RE (Oral Presentation)
Module: MPE-16: Non-Technical Competences
Location: Campus Offenburg

Lecturer(s):
Ms. Zumholz (Guest Lecturer)

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”, “Tesla”, “Daimler”, “BASF”), mining in the Black Forest, tourism, winegrowing and beer brewing, media enterprises (“Burda”)
- 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

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/File/downloads/Economy_-__Uppper_Rhine_Valley.pdf
- Guide to German culture, customs and etiquette: http://www.uni-frankfurt.de/46329991/Guide-to-German-culture_and-etiquette.pdf
Managing Complexity

Course ID: M+V3032
Level: All
Course Type: Lecture and Seminar
Semester Hours per Week: 2.0
Credits: 2 (ECTS)
Host Semester: MPE1
Examination: HA (Written Report)
Module: MPE-16: Non-Technical Competences
Location: Campus Offenburg

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

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
Materials Engineering Laboratory

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Lecturer(s):
Prof. Dr. Dipl.-Ing. Dietmar Kohler

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
Mechanical Process Engineering Lab

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Lecturer(s): N/A

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)
Process Control Engineering

Course ID: M+V916
Level: Bachelor + Master
Course Type: Lecture
Semester Hours per Week: 2.0
Credits: 2 (ECTS)
Host Semester: MPE1
Examination: K (Written Exam)
Module: MPE-15: Plant Safety and Control
Location: Campus Offenburg

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

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 oriented 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:
- Siemens: Manual of Siemens Simatic PCS 7 Getting Started, parts 1 and 2:
- http://www7.informatik.uni-wuerzburg.de/fileadmin/10030700/user_upload/vorlesungen/ss03/lit_reg_aut_tech.pdf
Tools to Manage Environmental Affairs

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

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=326 (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
## Business English

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**Lecturer(s):**  
Various (Guest Lecturer)

**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:**
- Provided in class
Advanced Business English

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Lecturer(s):
Various (Guest Lecturer)

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
Economics English

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Lecturer(s):
Various (Guest Lecturer)

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:
English for Engineers

Course ID: N/A
Level: All
Course Type: Seminar
Semester Hours per Week: 2.0
Credits: 2 (ECTS)
Host Semester: N/A
Examination: K (Written Exam)
Module: N/A
Location: Campus Offenburg

Lecturer(s):
Various (Guest Lecturer)

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:
- Provided in class
English for Information Technology Professionals

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Lecturer(s):
Various (Guest Lecturer)

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:
- Provided in class
English for Media Engineering

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Lecturer(s):
Various (Guest Lecturer)

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
- Provided in class
# English Refresher (B 1)

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**Lecturer(s):**
Various (Guest Lecturer)

**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
- Provided in class
Technical English

Course ID: N/A
Level: All
Course Type: Seminar
Semester Hours per Week: 4.0
Credits: 4 (ECTS)
Host Semester: N/A
Examination: K (Written Exam)
Module: N/A
Location: Campus Gengenbach / Campus Offenburg

Lecturer(s):
Various (Guest Lecturer)

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:
- Provided in class
### Topical Issues and Presentation Skills

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**Lecturer(s):**
Various (Guest Lecturer)

**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:**
- Provided in class