Courses taught in English at Albstadt-Sigmaringen University, Germany
as of 30.10.2023

Bachelor level (for Master level see last page**)**

If not mentioned otherwise, the classes will be offered during each semester. The number in the right hand column with the column title **Sem.** indicates the semester level (i.e. 3 = 2nd year, 1st semester; 6 = 3rd year, 1st semester, the higher the number, the more advanced the course). Students can mix classes from each semester level and also from different campuses.

Courses related to Business:
a) Albstadt campus:

Lecturer	Title	Code	Credits	Sem.
Prof. Gerhards	**Quality Management I:** • The students get an overview of the different aspects of quality and quality management. • The students get an overview of processes in product- an quality management of clothing companies and their influence to quality • The students learn the link between quality and sewing faults. • The students learn different methods to find the reasons for bad quality	IP 20090	2 ECTS	4
Prof. Gerhards	**Quality Management II:** • The students learn the necessity of quality-management-systems in companies • The students get an overview of the ISO 9000 ff family and learn to work with it • The students can develop the philosophy of Total Quality Management out of ISO 9004	TEX 33020	2 ECTS	6
Prof. Kimmerle	**Textile Ecology and sustainability** In the lecture, we examine and elaborate possible strategies for textile and clothing companies, how to setup an efficient working CSR team. We compare certification facilities and best available technologies within the complete global textile supply chain. From the idea, through efficient product development processes of garments and textile products, social and sustainable production processes and facilities, logistics to the retail and end of use of the products, we try to leave as little as possible footprint. Keywords: Case Studies, Eco labels, Textile Alliances, Green Technologies, Restricted Substance lists, EMAS, GRI, GOTS, Bluesign, Ökotex, Fair Wear Foundation, SA8000, Carbon Footprint, Textile Exchange, ….	TEX 22510	3 ECTS	3
To be determined	**Final Project** Topics to be discussed (only for students in their final year with major in Business)	IP 52010	12 ECTS	7

b) Campus Sigmaringen (detailed module descriptions below)

Lecturer	Title	Code	ECTS	Sem.
Prof. Dr. Wolf	**International Business 1** Global trade/FDI, global markets, international strategies, 2nternationalization theory, intercultural aspects, country assessment, ethics, etc.	BW 35610	6	6
Prof. Dr. Sachse	**International Business 2** Corporate Governance, CSR, risk management, International Human Relations, International Marketing, International Operations Management, International Organisational Design, etc.	BW 36100/111/14	6	7

Courses related to Textile (Albstadt campus):

Lecturer	Title	Code	Credits	Sem.
Prof. Gerhards	**Industrial Manufacturing Technology I** • The students learn basic sewing methods • The students learn how to sew pockets, cuffs and collars. • The final project will be the production of a men's shirt.	TEX 11510	4 ECTS	1
Prof. Baum	**Digital Construction** 1a • Basic pattern construction for blouse, dress and skirt • Modifications of darts, variation of sleeves • Size charts for different product groups (men, women, children) • Mass costumization	TEX 11029	2,5 ECTS	1
Prof. Gerhards	**Industrial Manufacturing Technology IV** • The students learn the sewing of a men's jacket step by step. • The final project will be the production of a women's jacket according to self-chosen sizes. ! Only for students who have a solid knowledge of sewing.	TEX 23520	6 ECTS	4
To be determined	**Industry-related project** Textile-related Preferrably for students with a background in textile who know how to design and sew garments.	TEX 32510	12 ECTS	6
To be determined	**Final Project** Topics to be discussed, please contact us in advance. Only for Textile students in their final semester.	IP 52010	12 ECTS	7

Courses related to Sustainable Engineering, open for all disciplines (Albstadt campus):

Lecturer	Title	Code	Credits	Semester
Mrs. Schütz	**Environmental Guidelines & Standards** **Environmental Policy** - history of environmental policy in Germany, - foundation of the Federal Environment Agency and its tasks • - Topics: Climate and energy, health, chemicals, traffic / noise, economy / consumption, waste / resources, air, water, soil / agriculture, sustainability / strategies • Immission control law • Nature conservation law • Soil protection law • Climate protection law • Water protection law • Waste law • Environmental standards: DIN EN ISO 14001 – environmental management systems & EMAS certification • Environmental policy in and outside Europe • Conventions: Basel, Rotterdam, Stockholm • Overview of world organizations and their responsibilities: United Nations, WHO, EU Commission & NGOs .. • UN Sustainable Development Goals – The 2030 Agenda for Sustainable Development • DIN EN ISO 14091 Adaptation to Climate Change – Vulnerability, Impact and Risk Assessment Targets: The students have integrated specialist knowledge in the field of environmental policy and current environmental specifications and standards. This also includes in-depth specialist theoretical knowledge. They know the country-specific and European environmental regulations and standards, can apply and interpret them and are able to have a say in environmental issues. The students develop an awareness of the problem of ecological, social, economic and aesthetic interactions between production and consumption in a global context (understanding). They are able to use the laws and obligations along the entire supply chain to assess the quality of production processes in a responsible manner and to specify examination methods.	STE 11020	3 ECTS	Spring semester only
Prof. Baum + external lecturer	**Social Aspects and Ethics** ▪ The students get an overview of morally valuable acting guidelines ▪ The students get an overview of the 17 UN Sustainable Development Goals • A current industrial or social ethical problem will be discussed related to its social, ecological and economical aspects Study cases from the areas: Work Ethic, Corporate Social Responsibility, Technology Ethics	STE 11010	2 ECTS	Spring semester only

Prof. Dr. Forcillo	**Environmental Technologies** ▪ The students get an introduction in Definition and principles of sustainability: the importance of green engineering Content of the Course: ▪ Energy: Energy generation, Combustion, regenerative energies, energy storage, energy networks (central and decentral) Sustainable Use of Energy, sustainable mobility and logistic concepts. ▪ Waste treatment and Recycling technologies: Material Recycling, Water protection, Air pollution control technologies, Sound and Vibration emissions Radiation, UV, nuclear radiation and emission.	STE 11510	5 ECTS	Spring semester only
Ms. Mieke Klein	**Life Cycle Assessment 1** The students master the theoretical basics of impact analysis, are able to apply and interpret ISO 14040/44 and have knowledge of methodological developments and current scientific discussions. Students are able to independently design LCA models and implement, analyze and interpret them using various commercially available IT solutions. They assess their own LCA results and their sensitivity/meaningfulness; in addition, the students critically question existing other LCA models and identify potential for improvement or innovation. **Content of the lecture** • Introduction to LCA • Accounting principles and axiomatic foundations • Application of the Leontief model • Basics of material flow networks • Levels and terms of LCA according to ISO 14040/44 • Allocation in co- and recycling processes Attributional / consequent LCA • Thinking in terms of product/process systems • Inventory modeling, energy and material balances • Impact assessment models • Interpretation of LCA results • Possibilities and limitations of the LCA method • Practice of inventory modeling • Dealing with data scarcity • Modeling environment and databases	STE 13520	5 ECTS	Fall semester only

Dr. Mader	**Technology Assessment** The students know the fields of application of technology assessment (TA) and understand the relevance of TA for sustainable development. Through lectures, they will get an overview of international political, organizational and institutional aspects of TA as well as its qualitative and quantitative methods. The students a) reflect beyond TA on the role of opinions and values of different stakeholders for the implementation of technologies. b) recognize and understand interrelationships of socio-technological transitions. **Content of the lecture** • TA and sustainable development • socio-technological transition • evaluation of sustainable development and TA • technology assessment: history, institutions • stakeholder analysis • influencing factors analysis • scenario technique • role of opinions and values in TA, Landscape of Opinions for Technology • Assessment	STE 13530	3 ECTS	Fall semester only
Kjersti Kviseth Anna Rodewald	**Circular Economy 1** An introduction to the circular economy and what it means for the textile industry. Circular economy is spreading all over the world in many industrial sectors. The textile industry is one of the largest and most extensive global industries with about 300 million people in work and over 4% of the total climate emissions. We buy a lot more textiles and clothes than we used to and keep them for a much shorter time. This industry urgently needs a change and many players are already on the right path towards circular economy. What does this mean for the industry? For design, manufacture, materials, consumption and waste? And what about the economic model? Circular economy is not a new idea and learning about history is of course part of it, as are contemporary thinkers in general and in the textile world in particular. We get inspiration from good examples of today's design world and different players. Learning objective:	STE 13510	3 ECTS	Fall semester only

	To understand the changes in the industry and what this may mean for the students' respective future work areas, along with inspiration for a brighter future for all. Central topics are u.a. -Present circular economy principles and history -Challenges of the global industry -Actors, organizations, labels and tools -Sustainable Development Goals -Regenerative and positive impacts, materials and cycles -Design for circularity -lifespan -Recycling: technology and research			
Prof. Kimmerle / Ms. Holzschuh	**Circular Economy 2** Students have a broad and holistic knowledge of material flows and resource management. They are able to assess the economic and social aspects of waste and resource management and to integrate them into the overall process of a company and develop them further. Students are able to independently develop, design, reflect and evaluate resource cycles. Content of the lecture: ▪ Material flows and resource management ▪ Management systems (ISO 14001, ISO 50001) ▪ Raw material management ▪ Waste prevention ▪ Waste recycling ▪ Waste composition ▪ Waste collection and transport ▪ Waste treatment (glass, waste paper, plastics, packaging, metals, products) ▪ Landfilling	STE 21010	3 ECTS	Fall semester only
Ms. Mieke Klein	**Life Cycle Assessment 2** Students will know the main environmental impacts used to evaluate products and processes. Students know professional LCA databases and how to use them, can use the databases and assess their quality. Students know different approaches to assessing products and processes, master the assessment methods required for this purpose, understand the complexity of assessing material and energy balances, are aware of	STE 21020	5 ECTS	Fall semester only

	methodological challenges in assessing products and processes and take this into account in their approaches to solving problems. **Content of the lecture** • Environmental impacts / technology assessment. • Individual ecological impact categories and their scientific background. Background • Different midpoint and endpoint methods • Process and impact databases (computational practical course) • Structure of process databases, central terms and functions • Exemplary use of a professional process database • Linking to LCA software • Evaluation of products and processes • Design of two or more different products / processes consisting of several technologies together with the students • Evaluation of these processes by means of different methods: ecological evaluation (carbon footprint, environmental footprint, consideration of area issues...), energetic evaluation (exergetic method, efficiency method,...), economic evaluation (investment decision, deployment decision, deconstruction decision...)			
Ms. Holzschuh	**Environmental Risk Management & Sustainable Quality Management** The students learn how to set up an environmental risk management in companies, which includes setting up a chemical management system according to current guidelines. The course also teaches how to transparently implement an environmental management system. **Content**: • Process steps of operational environmental risk management • Environmental risk analysis • Environmental Risk Assessment, Environmental Risk Response • Development of an RSL (restricted substances list) • Overview (update from the first semester) of the common standards, test regulations & certifications • REACH chemicals regulation • Sustainable quality management • Environmental reporting	STE 23510	3 ECTS	Spring semester only
Prof. Dr. Sachse	**Sustainable Business Models**: This course provides an overview of sustainable business model theory and innovation and	STE 23520	2 ECTS	Spring semester only

	discusses business models as essential tools in transforming to more sustainable businesses. Throughout the course, we will use the theory of sustainable business models and sustainable business model innovation as a foundation to investigate how companies can implement more sustainable business practices. By the end of the course, you will have an understanding of some challenges and opportunities companies face in their work towards creating more sustainable business models. You will be able to explain, discuss, and critically use the sustainable business model theory and tools to manage innovation towards more sustainable practices. An integrated teaching model will be adopted by combining web-based lecturing with group discussions, in-class exercises, mini-projects, individual assignments, home exercises, case analysis and presentations, all in digital formats. Extras: Interviews with company representatives (planned) What will you learn: • Sustainable business model theory • Sustainable business model innovation • Tools and strategies for sustainable business model innovation			

Courses related to Engineering (Albstadt campus):

To be determined	**Project** Topics to be discussed, only for students with background in Mechanical Engineering	MA 42010	10 ECTS	6
Dr. Tijani	**Introduction to Matlab** (description see below)	MA 21020	2,5 ECTS	6
To be determined	**Final Project** Topics to be discussed Only for students who are in their final year in Mechanical Engineering.	IP 52010	12 ECTS	7

Courses related to Computing and Cyber Psychology (Albstadt campus) (all module descriptions please see below)

Lecturer	Title	Code	Credits	Sem.
to be determined	**Project in Computing** Independent work on a real project with the topic out of the study area, from problem analysis until the final product. This happens in a group. Teams are guided by a professor and teaching assistants.	ITS 23505/23510	7,5 ECTS	5
to be determined	**Final Project** Pre-requisite: Student must be proficient in programming in Java, C# and C++, only for students in their final study semester.	IP 52010	12 ECTS	7
Prof. Morgenstern	**Digital Forensics:** - Introduction to forensic sciences in general and digital forensics in particular	ITS 23205	5 ECTS	5

	- Methodical foundation of digital forensics, embedded in classical analogue forensics - Forensic principles in securing and analyzing digital spotting and presentation of forensic investigations (internally and in court) - Practical applications in various areas of digital forensics (e.g., disk forensics, application forensics, digital forensics, mobile devices)			
Hr. Wagner	**IT Security management:** - Fundamentals and significance of IT security management - Legal requirements - IT security standards - IT security management process - IT security management according to BSI basic protection - Standards and certification - Organizational aspects	ITS 32405	2,5 ECTS	7
Prof. Dr. Fein	**Mobile and Cloud Forensics:** - Digital forensics in the context of mobile devices (smartphones, navigation devices, etc.) - Special features in the area of forensic backup and analysis of mobile devices (operating systems, file systems, data formats, access options and restrictions) - Digital forensics in the context of cloud computing - Special features in the area of forensic protection and analysis of cloud systems (architectures, service and organizational models, trust models, access options and restrictions) - Practical applications and exercises in digital forensics of mobile devices and cloud systems	ITS 32505	2,5 ECTS	7
Prof. Dr. Jungk	**Offensive security measures:** - Offensive methods and their goals in the context of IT security - Legal and Ethical Framework - Fundamentals, framework conditions and goals of penetration tests - Attacks on the confidentiality, integrity or availability of >transmission channels >networks >operating systems >Applications >Hardware components >Web applications >radio systems - Finding vulnerabilities through fuzzing and code analysis Laboratory work	ITS 24405/24410	7,5 ECTS	5

	The points dealt with in the lecture are practically tested in the internship within an isolated network. Current tools and systems from the penetration test and system analysis area such as Burp Suite, Nmap, and the Metasploit Framework			
Prof. Dr. Sütterlin	**Introduction to Cyberpsychology** The module "Introduction to Cyberpsychology" discusses a variety of aspects in the area of human perception, emotions, decision-making and other aspects of behavior in the context of cyberspace and online worlds. The module is of interest for students of all areas where the interaction of humans with computers plays a role. No previous knowledge of computer science or psychology is required. Examples for topic areas covered in the module are: - Gaming, Games and Gamification - The human factor in IT-Security - Cybercrime and cyber defense - Dark Patterns, Usability, and manipulation via user interfaces - Bio-psychological aspects of human-computer interaction (e.g. brain-computer interfaces) - Cognitive aspects of deep fake recognition - Generation, spread and effects of political disinformation in cyberspace - Trust in automation and human-robot-interaction	ITS 23460	2,5 ECTS	4
Prof. Dr. Sütterlin	**Human Factors in IT-Security** - Psychological aspects of cybercrime - Internal threats - Social Engineering - Dark Patterns - Expertise and indicators of performance typologies, profiles and motivations of perpetrators - Security awareness and interventions - Cooperation and communication of IT-security threats and incidents - Ergonomic aspects of IT-security behavior and interface design - Gamification approaches to improved IT-security behavior - Research Methods for IT-Security - Recruiting, assessment, performance monitoring, predictors of success **Only for students who are min. in their 3rd year of studies**	AIS 55005	6 ECTS	2 Master, but **open** for adv. Bachelor students **SPRING SEM. only!**
Prof. Dr. Sütterlin	**Applied Cyberpsychology:** - Biopsychosocial concepts of perception, cognition and action - Decision-making in digital and hybrid environments - Performance under pressure - Expertise and accelerated learning - Foundations of behavior change and teaching concepts - Principles of organizational psychology	AIS 54505	6 ECTS	1 Master, but **open** for adv. Bachelor

	- Particularities of human behavior in virtual environments and anonymity/pseudonymity - Macrocognition and group effects in online communities and social influences - Principles of neuro-ergonomics and neurocognition - Motivation, emotions and decision-making - Interdisciplinary cooperation and leadership styles, team communication **Only for students who are min. in their 3rd year of studies**			students **SPRING Sem. only!**
to be determined	**Internship semester** on request for students who are staying for 2 semesters			

Courses related to Life Sciences (Sigmaringen campus only) (detailed descriptions see below p. 28 ff)**:**

Lecturer	Title	Code	Credits	Semester
To be determined	**Final project** Topics to be discussed Only for students who are in their final year in Food Technology / Nutrition.	IP 52010	12 ECTS	7
To be determined	**Research Project:** The research project is an in-depth study of an issue or topic from all fields related to food (food technology, food processing, packaging, process control, quality management…), nutrition, appliance technology and hygiene. It may be in the form of a small-scale research study, a case study, a program evaluation or a report on a field placement.	LE 42010	5 ECTS	5 - 7
Prof. Dr. C. Gerhards	**Food Technology:** Students know how food is composed. They learn how molecular properties influence the physical and chemical properties of foodstuffs. They are informed, how food is being processed, involving their knowledge about molecular properties of food.	LE 23500/11/12	5 ECTS	3
Prof. Dr. Klingshirn	**Physical Food Analysis:** The module covers the theory of as well as practical training in various analytical techniques used in modern physical analysis of food ingredients and processed foods.	LE 32521/22	2,5	6
Prof. Dr. Klingshirn	**Food Product Development:** Continuous product development is a crucial success factor in food industry, from refining of an established product range to developing completely new products.	LE 32510	2,5	6
Prof. Dr. Hempel	**Applied Sensory and Consumer Science:** Understanding food choices is of fundamental importance for product development/improvement. Sensory & consumer science can help to understand some of the key factors influencing food choices. This course focuses on real-world expertise and explores new techniques, as well as the foundational theory behind current methods of sensory evaluation & consumer science for both edible and non-edible products.	LE 38500/11/12	5	6
Prof. Dr. Klingshirn	**Human Nutrition - Basics** - Introduction to Human Nutrition: A Global Perspective on Food and Nutrition - Food Composition - Physical Activity: Concepts, Assessment Methods and Public Health Considerations - Nutrition Research Methodology - Food and Nutrition: Policy and Regulatory Issues - Food and Nutrition-Related Diseases	IP	5	4

Lecturer	Title	Code	Credits	Semester
Prof. Dr. Eilts	**Hygiene and Environmental Health:** Since hygiene as a science considers all factors that influence human health, the interrelationships between humans and their environment are also in focus. Microorganisms (bacteria, viruses, fungi and parasites) exist naturally in the environment and on or within the bodies of animals and people. There are other sources of microorganisms that may cause infection and these include a person's own normal microbial flora and environmental sources such as air, water, or equipment that may have become contaminated.	LE 43060	2,5 ECTS	7
Prof. Dr. M. Schmid	**Sustainable Packaging Technology**: This seminar presents a basic overview of packaging technology with emphasis on packaging sustainability.	LE 43050	2,5 ECTS	7
Prof. Dr. Klingshirn & Prof. Dr. Eilts	**Customer Centric Design** The course focuses on the "Customer Centricity" approach in product development, which sees the consumer instead of the products as the starting point for new developments and starts with the needs and wishes of consumers in all areas from product design, marketing and sales	LE 43080	2,5 ECTS	7
Prof. Dr. Maier-Nöth	**Health and Nutrition Psychology** The course focuses on understanding the interactions between body, psyche and socio-cultural factors with the help of scientifically based approaches: How do psychological factors influence eating behavior? How do eating disorders arise, how can they be prevented or cured? How can you guide people to healthy eating habits and thus avoid diet-related diseases?	LE 43070	2,5 ECTS	7
Prof. Dr. A. Schmid	**Sterile Technology:** The module is focusing on the manufacture of sterile pharmaceuticals. The participants gain broad practical knowledge about sterilization processes (including validation), aseptic processing conditions and the associated technologies, aseptic transfer and filling, and hygienic design of facilities and machinery. Additional exercises and practical training (focusing on validation of aseptic processes and visual inspection) prepare the participants for future tasks in sterile manufacturing.	PH 35500/11/12/13	5 ECTS	6
Prof. Dr. Stoll	**Comprehensive Biotechnology** The module covers the workflow in state-of-the art production of biologics. Concepts of the upstream process, knowledge in kinetics and process management are important parts of the course. Furthermore the isolation of biologics API in the downstream	PH 36000/11/12	5 ECTS	6

	process is the second main focus of the course.			
Prof. Dr. Müller	**Galenics of Biopharmaceuticals**: Students know galenic principles of biopharmaceuticals. They know the specific characteristics of biopharmaceuticals as well as the main principles of research and development. They are informed how biopharmaceuticals are being processed. Pre-requisites: Basic knowledge in pharmaceutical technology	PH 35000/11/12/13	5	6
Prof. Dr. Stoll	**Modern Pharmaceutical Analytics** The module covers aspects of modern analytics in pharmaceutical research and industry. Mainly techniques applied in biomarker identification and bioanalytics are presented. Furthermore exercises in GxP compliant analytical validation of simple assays and data sets are performed.	PH 43050	2,5	7
Prof. Dr. Köhler	**Pharmaceutical Technology 2**: The module covers the theory of as well as practical training in various fields of Pharmaceutical Technology research topics as well as Manufacturing topics always in respect to Pharmaceutical Industrial Processes.	PH 43010	2,5	7
Tbd	**Project thesis:** The project thesis is an in-depth study of an issue or topic from all fields related to the pharmaceutical development and production including packaging, process control, quality management,…). It may be in the form of a small-scale research study, a case study, a program evaluation or a report on a field placement. ➔ Only for students with Pharmaceutical /Biomedical/… background	PH 42510	5	6

Language courses (Albstadt campus or online):

Lecturer	Title	Code	Credits	Sem.
Mrs. Rembold	Technical English	IP 10030	2,5 ECTS	1-4
Mr. Schmittinger	Business English	IP 10010	2,5 ECTS	1-4
Mr. Schmittinger	English Conversation and Grammar	IP 10020	2,5 ECTS	1-4
Mr. Bozkurt	English 1 (with focus on sustainable engineering)	STE 12010/12020	5 ECTS	Fall semester only
Mrs. Bitzer-Alber	English 2 (with focus on sustainable engineering)	STE 14010/14020	5 ECTS	Spring semester only
N.N. (online)	German as a Foreign Language – Beginners	IP 11010	2,5 ECTS	1-4
N.N. (online)	German as a Foreign Language – A2 level	IP 11020	2,5 ECTS	1-4
N.N. (online)	German as a Foreign Language – B1 level	IP 11050	2,5 ECTS	1-4
N.N. (online)	German as a Foreign Language – B2 level	IP 11060	2,5 ECTS	1-4

Module title: Project work						
Code 42000	**Workload** 330 h	**Type of Course(s)** Project	**Semester** 7	**Duration** 1 semester	**Frequency** Spring + Fall	
1	**Part(s) of the module:** 42010 Project work	**Language**: English	**Class Contact time (hours)** 30h	**Self-study time (hours)** 300 h	**Credits (ECTS)** 11	
2	**Mode of delivery:** Project work					
3	**Learning outcomes:** The students: - gain awareness of the various aspects of social competence and experience self-awareness in teamwork - learn to apply the theoretically acquired knowledge to practical problems from the development and research activities of the faculty as part of a team - are able to formulate and present the result of a complex problem in a form and content comprehensible for peers Knowledge level 6, skill level 6, social competence level 6, independence level 6					
4	**Course contents:** • Project presentation • Development of project goals • Bibliographical study • Pre-dimensioning, dimensional calculations, and assembly design with CAD (according to project requirements) • Setting up a work, time and budget plan • Formulation and allocation of subtasks to the individual team members • Monitoring and coordination of the content and timing of the project in the weekly project meetings • Presentation of the partial results of the project at regular intervals with solution evaluation and solution selection. This can/should also be partly in English. • Final presentation and discussion at the end of the project (will be evaluated) • Preparation of a final report, in which all participants must contribute (the personal contribution must be indicated as a prerequisite for the performance evaluation) Recommended Literature: • Kraus, G.: Projektleiter mit Profil, Hamburg 1994 • Madauss, B.-J.: Handbuch Projektmanagement, Stuttgart 1994 • Stumbries, C.: Projektmanagement Handbuch, ProLog GmbH, Jaderberg 1994 • Litke, H.-D.: Projektmanagement – Methoden, Techniken, Verhaltensweisen, München, Wien, Hanser 1995 • Burghardt, M.: Projektmanagement. Erlangen, Publicis-MCD-Verlag, 2000					
5	**Prerequisites:** None					
6	**Exam:** Overall mark for - Project work in a team of students - Oral presentation - Preparation of a final report, in which all participants must contribute (the personal contribution must be indicated as a prerequisite for the performance evaluation)					
7	**Requirement for credits:** Students must pass - Project work in a team of students - Oral presentation - Preparation of a final report, in which all participants must contribute (the personal contribution must be indicated as a prerequisite for the performance evaluation)					
8	**Applicability of the module:** Material Science, Mechanical Engineering (Bachelor)					
9	**Responsible instructor:** Professors of Mechanical Engineering					

Module: Elective course	**Module title:** **Introduction in MatLab**
Semester: Bachelor	**Modul-Code:** MA 21020
Hours / semester: 2	**ECTS-credits:** 2,5
On offer: semiannual / WS / SS	**Language of instruction:** English
Lecturer: Dr.-Ing. Yakub Tijani	**Responsible Professor:** Prof. Dr.-Ing. André Heinrietz

Competences to be acquired:

Students

- Have knowledge about MatLab progamme structure
- Can transfer mathematical tasks in MatLab algorithms
- Can programme error-free MatLab skripts

Content:

- MatLab workbench structure
- Data types, handling matrices and vectors
- Programming loops
- Branching
- Subroutines / functions
- How to use complex MatLab library functions (data fit, optimization, equation solving)
- MatLab – Central user community

Literature:

- MatLab Manual, Ver. 2016

Teaching form:

Laboratory 15 x 2 h = 30 SWS (blocked, 3 x 10h), exact dates in WebUntis

Workload:

2,5 ECTS = 75 workload (WL), containing:

• Lectures	30 WL
• Preparation presentation	45 WL

Exam:

- Presentation

International Business 1

Course title: International Business 1		**Code:** BW35610	
Courses: International Business 1		**Level:** 3	
Lecturer: Prof. Dr. Sachse Prof. Dr. Schmidt-Endrullis	**Teaching Method:** Lecture, Cases, In-class discussion, Group Work	**ECTS:** 6	**SWS:** 4
Work Load: Contact time: 45h, Preparation: 45h, Reflection: 35h, Exam preparation: 25h			
Expected Knowledge Courses from the first four semesters **Usability of this course:** Course 38010: International Business II		**Course volume:** 150h	**Semester:** 6

Course objectives

With the completion of this course, students will gain an overview of basic aspects of globalization and its impact on international business. The students will developed a basic understanding of the main actors and institutions. They have an overview of international economies and understand the context of political, economical, socio-cultural and institutional environment. They have a basic understanding of relevant internationalization theories, can analyze countries and international customer segments on its attractiveness, know possible internationalization strategies and market entry forms and can comparatively evaluate them.

In contrast to "International Business 2", students develop know-how on the main questions on how to start with the internationalization process of the firm and the successful design of international market entry from entrepreneurial/managerial perspective.
The presentation charts used in-class as well as cases and readings are available at ILIAS Learning platform of our Faculty Business Science and Management, www.hs-albsig.de.

Course description

- Globalisation, foreign direct investment, international trade, emerging markets (Bottom of the Pyramid phenomenon), political, economical, social and institutional environment
- International economic regions, Institutions and organisations
- Intercultural aspects of international business
- Internationalization theories (3Es, Configuration approach, GAINS, Uppsala-Model, Born-Global, network theory)
- Country selection, country evaluation, management of country portfolios
- International strategies (strategic options for market entry, internationalization process)

In each semester guest lecturer speak about current problems and share experiences
(recent speakers: Transparency International, Nokia Siemens Network, Ifolor, Walz, Federal Ministry for Economic Cooperation and Development, Daimler)

Literature:

Griffin, R.W./Pustay, M.W.: International Business, Pearson
Lassere, P.: Global Strategic Management, Palgrave
Peng, M./Meyer, K.: International Business, Cengage Learning
Volberda, Henk W./Morgan, Robert E./Reinmoeller, Patrick/Hitt, Michael/Ireland, Duane, R./Hoskisson, Robert E.: Strategic Management, Cengage Learning
J. Wild/K. Wild: International Business, Pearson

Assessment: Written exam (90min.)	**Language:** English

International Business 2

Course title: International Business 2		**Code:** BW 36100/111/14	
Courses: International Business 2		**Level:** 3	
Lecturer: Prof. Dr. Sachse	**Teaching Method:** Lecture, Cases, In-class discussion, Group Work	**ECTS:** 6	**SWS:** 4
Work Load: Contact time: 45h Preparation: 45h Reflection: 35h Exam preparation: 25h			
Expected Knowledge Modul 36510: International Business I		**Course volume:** 150h	**Semester:** 7

Course objectives

With the completion of this course, students will gain deeper knowledge on the central functions for developing the international activities abroad after the initial market entry. In contrast to "International Business 1", students develop know-how on the main questions on how to operate and manage international activities (e.g. international human resources and labor relations, procurement, international/export marketing, sales, supply chain management, organizational design, corporate governance)

The presentation charts used in-class as well as cases and readings are available at ILIAS Learning platform of our Faculty Business Science and Management, www.hs-albsig.de.

Course description

- International Human Resource Management
- (International Leadership Concepts, International Staffing, Training, Performance Appraisal, Expatriates)
- International Operations Management (Sourcing, Supply Chain, Manufacturing, Logistics)
- International Marketing & Export Management (selected aspects on international pricing, international product/branding, international distribution, international communication)
- International Organizational Design
- International Corporate Governance within the context of CSR and Business Ethics

In each semester guest lecturer speak about current problems and share experiences
(recent speakers: Transparency International, Nokia Siemens Network, Ifolor, Walz, Federal Ministry for Economic Cooperation and Development, Daimler)

Literature:

Dowling, P.J./Festing, M./Engle, A.D.: International Human Resource Management, Cengage
Goergen, Marc: International Corporate Governance, Pearson
Griffin, R.W./Pustay, M.W.: International Business, Pearson
Hollensen, Svend: Global Marketing, Prentice Hall
Lasserre, Philippe: Global Strategic Management, Palgrave Macmillan
Peng, M./Meyer, K.: International Business, Cengage Learning
Wild/K. Wild: International Business, Pearson

Assessment: Written exam (90min.)	**Language:** English

Module: Studium Generale	**Course:** German as a foreign language A1
Semester: Bachelor	**Module-Code:** IP 11010
Teaching hours: 2	**ECTS-Credits:** 2,5
Course is available: WS / SS	**Language of instruction:** German
Teaching staff: N.N.	**Responsible professor:** --
Acquired competences at the end of the course: Can understand and use familiar, everyday expressions and very simple sentences, which relate to the satisfying of concrete needs. Can introduce him/herself and others as well as ask others about themselves – e.g. where they live, who they know and what they own – and can respond to questions of this nature. Can communicate in a simple manner if the person they are speaking to speaks slowly and clearly and is willing to help.	
Content: Introduce yourself / Greetings / numbers / time / talk about your family / going out for dinner /week days / shopping / reading timetables and many more everyday situations Grammar: definite + indefinite articles / conjugation of verbs / cases / possessive pronouns / connectors /	
Literature: Handouts	
Teaching methods: Classroom and online teaching	
Examination: tests every 1-3 weeks, homework, attendance	

Module: Studium Generale	**Course:** German as a foreign language A2
Semester: Bachelor	**Module-Code:** IP 11020
Teaching hours: 2	**ECTS-Credits:** 2,5
Course is available: WS / SS	**Language of instruction:** German
Teaching staff: N.N.	**Responsible professor:** --

Acquired competences at the end of the course:

Can understand sentences and frequently used expressions related to areas of most immediate relevance (e.g. very basic personal and family information, shopping, local geography, employment).
Can communicate in simple and routine tasks requiring a simple and direct exchange of information on familiar and routine matters.
Can describe in simple terms aspects of their background, immediate environment and matters in areas of immediate need.

Content:

Family / living together / being mobile / leisure activities / digital environment / past and present situation / work situations / culture / …

Grammar: relative clauses / past tense / conjunctions / indirect questions / verbs with two objects / verbs with different cases/passive sentences

Literature:

Handouts and videos

Teaching methods:

Classroom and online teaching

Examination:

tests every 1-3 weeks, homework, attendance

Module: Studium Generale	**Course:** English Conversation and Grammar
Semester: Bachelor	**Module-Code:** IP 10181
Teaching hours: 2	**ECTS-Credits:** 2,5
Course is available: WS / SS	**Language of instruction:** English
Teaching staff: Mr. Gerd Schmittinger	**Responsible professor:** N.N.
Acquired competences at the end of the course: In addition to acquiring new vocabulary, students will gain more self-confidence using English as medium of communication.	
Content: The main aim of the course is to improve oral communication skills focusing on everyday situations. Off the cuff speaking as well as creative writing on topics of own interest forms the basics of the course. Emphasis will be on idiomatic English and proper pronunciation.	
Literature: Handouts	
Teaching methods: Classroom teaching	
Examination: At the end of the course there is a final oral (80%) and written (20%) evaluation.	

Module title: Foreign language 1 (emphasis on Sustainable Engineering)

Module code	Workload	Type of Course	Semester	Duration	Frequency
STE 12010/12020	150 h	Taught	1	1 Semester	WS and SS

1	**Part(s) of the module:** Englisch 1	**Language** Englisch	**Class Contact time (hours)** 60 h	**Self-study time (hours)** 90 h	**Credits (ECTS)** 5

2 **Mode of delivery / Hours per week in semester:**
Lecture, seminar / 4h per week

3 **Learning outcomes, competencies:**
The students
- master the English vocabulary and grammar structures of level B2, as well as basic vocabulary from the field of sustainability.
- write and speak grammatically correct sentences and can evaluate and improve grammar that has been read.
- have the knowledge to express themselves clearly and in detail on a wide range of academic topics (knowledge).
- are able to determine the main content of complex texts on abstract topics.
- discuss and converse spontaneously and fluently with native speakers about the content of daily life, current political events as well as the academic content of technical courses and in professional situations.
- explain their own point of view and analyze the advantages and disadvantages of various options (application competence).
- prepare a presentation in English in which they introduce and explain procedures, methods, products or technologies (methodological competence).

4 **Learning contents*:***
- buildup and enhancement of a passive and active basic vocabulary in terms of words by means of subject specific texts, audios and film material from various areas: sustainability, natural sciences, economic- and social development
- teaching speaking expression in a foreign language through questions and answers, problem investigation, discussions, presentations
- teaching written verbalism with regards to English language by means of wording/ phrasing and answering questi on dealt with texts in a foreign language as well as writing summaries, work processes, business letter
- teaching written expression in a foreign language through questions and answers, problem investigation, discussi
- teaching vocal expression in the English language by means of questions and answers, problem investigations, presentations in English, description of different types of processes
- teaching work-related assignments and responsibilities as an engineer, social smalltalk with regards to work conte and grammar on an advanced level

5 **Literature*:***
- Caradonna, J. L. (2014). Sustainability: A History; Oxford University Press
- Farley, M. H.; Smith, Z.A. (2020).Sustainability: If It's Everything, Is It Nothing? (Critical Issues in Global Politics); Routledge
- Förster, L. et al. (2018). Business English: Alle wichtigen Vokabeln und Redewendungen für den Job; Haufe
- Hollett, V. (2008). TechTalk; Oxford University Press
- Mautner, G. (2019). Wissenschaftliches Englisch; UVK Verlag
- Murphy R. (2021). English Grammar in Use Book with Answers: A Self-Study Reference and Practice Book for Intermediate Learners of English; Cambridge
- Roche, M (2019). Business English Writing: Advanced Masterclass; idm business&law
- Weybrecht, G. (2015). The Sustainable MBA: A Business Guide to Sustainability; Wiley & Sons

6 **Prerequisites:** Knowledge of Englisch (min. B1 level)

7 **Exam:** Written exam (60 min) graded; Homework (pass/fail)

8 **Requirements for credits:**
Pass exam and homework.

Module title: Foreign language 2 (emphasis on Sustainable Engineering)

Module code	Workload	Type of Course	Semester	Duration	Frequency
STE 14010/14020	150 h	Taught	2	1 Semester	WS and SS

1	**Part(s) of the module:** Englisch 2	**Language** Englisch	**Class Contact time (hours)** 60 h	**Self-study time (hours)** 90 h	**Credits (ECTS)** 5

2 **Mode of delivery / Hours per week in semester:**
Lecture, seminar / 4h per week

3 **Learning outcomes, competencies:**
The students
- can use a wide variety of expressions that enable them to cover a wide range of topics in everyday life, at work, or in academic situations (Knowledge)
- have a command of English vocabulary and grammar structures at level C1 (CEFR), as well as basic vocabulary in the field of technical English
- can follow speeches (speech contribution) and understand them (logically)
- have specific expressive skills in Business English that allows them to communicate adequately in work-related situations
- can understand non-fiction texts, technical articles and longer technical manuals, even if they are not necessarily in their own area of expertise (reading comprehension)
- can use the language effectively and flexibly in social and professional life and clearly express thoughts and opinions (communication competence)
- are able to express themselves clearly and in a well-structured manner in writing (Application competence /Writing competence)
- can write letters, longer essays, or reports about complex issues and identify/underline/emphasize essential aspects

4 **Learning contents*:***
- (Further) development and consolidation of language skills in the area of Business English at an advanced level.
- Development and extension/expansion of passive and active (general and specialized) vocabulary of the English business language on the basis of texts from various fields: industry and trade, finance, human resources, sales contract, international economic relations, current economic policy, etc.
- Training of written expression in the foreign language through questions and answers, discussion of problems, discussions.
- Training of oral expression in the foreign language through questions and answers, Discussions of problems, discussions and presentations.
- Discussion of intercultural and cultural issues in the foreign language. The DOs and DONTs in daily interactions. Body language (nonverbal communication) and avoiding misunderstandings in international dealings with customers, suppliers, colleagues, etc. Composing business correspondence (obtaining information, writing inquiries, writing complaints, etc.)

5 **Literature*:***
- Murphy, R.: English Grammar in Use. Cambridge: University Press, 2015.
- Lewis.Schätz, S. (2011). Großes Wörterbuch Business English. Compact Verlag
- Further literature will be given during class

6 **Prerequisites:**
Knowledge of Englisch (min. B2 level)

7 **Exam:**
Written exam (60 min) graded

8 **Requirements for credits:**
Pass exam

Course Name: Technical English

Semester: spring semester + fall semester
Semester hours per week: 2 hours per week
credits: 2,5 ECTS credits
Language of instruction: English
Instructor: Lucy Rembold
Course Content: the following topics are covered during the course: • Technical vocabularies and phrases • Technical writings • Technical English Discussions and Debates • Interview tricks and techniques for Engineers • Writing Thesis in English • Presentation techniques • Improving overall communication skills
Course Objectives: By the end of the course, the students are expected to be able to: • Increase their knowledge of English in technical fields • Write and read basic technical reports, emails • Expand vocabulary related to technical English • Develop presentation skills in engineering fields • Familiarize with writing thesis in English • Build confidence in job interviews using English
Course Format: Group setting
Exam: Oral exam

Module: Studium Generale	**Course:** Business English
Semester: Bachelor	**Module-Code:** IP 10010
Teaching hours: 2	**ECTS-Credits:** 2,5
Course is available: WS / SS	**Language of instruction:** English
Teaching staff: Mr. Gerd Schmittinger	**Responsible professor:** n.n.
Acquired competences at the end of the course: In addition to acquiring more business related vocabulary and gaining more self-confidence using English as medium of communication, students will be able to write business letters, conduct meetings and compile business presentations using media such as PowerPoint.	
Content: The aim of the course is to improve written and oral communication skills focusing on the business environment. During the lessons students will acquire topic related vocabulary, use this vocabulary in dialogues, write and present their own dialogues, conduct business meetings and write business letters and essays. Emphasis will be on idiomatic English and proper pronunciation.	
Literature: Handouts	
Teaching methods: Classroom teaching	
Examination: At the end of the course there is a final oral (40%) and written (60%) evaluation.	

Module title: Digital Forensics						
Code ITS 24305	**Workload** 150h	**Type of Course(s)** Taught	**Semester** 5		**Duration**	**Frequency**
1	**Part(s) of the module:**		**Language** English	**Class Contact time (hours)** 60h	**Self-study time (hours)** 90h	**Credits (ECTS)** 5
2	**Mode of delivery / Hours per week in term:** Taught, 4 hours per week					
3	**Learning outcomes:** The students - are familiar with the methodological foundation of digital forensics and its embedding in classical analogue forensics - understand forensic principles in securing and analyzing digital traces - can document and present the forensic examinations, eg. In court - are able to apply the techniques learned in various areas of digital forensics (e.g., disk forensics, application forensics, digital forensics, mobile devices)					
4	**Course contents:** - Introduction to forensic sciences in general and digital forensics in particular - Methodical foundation of digital forensics, embedded in classical analogue forensics - Forensic principles in securing and analyzing digital spotting and presentation of forensic investigations (internally and in court) - Practical applications in various areas of digital forensics (e.g., disk forensics, application forensics, digital forensics, mobile devices)					
5	**Prerequisites:** None					
6	**Exam:** Oral presentation, 20min					
7	**Requirement for credits:**					
8	**Applicability of the module:**					
9	**Responsible instructor:** Prof. Holger Morgenstern					
10	**Additional notes and comments:**					

Module title: IT security management						
Code ITS 32405	**Workload** 75h	**Type of Course(s)** Taught	**Semester** 7		**Duration**	**Frequency**
1	**Part(s) of the module:**		**Language** English	**Class Contact time (hours)** 30h	**Self-study time (hours)** 45h	**Credits (ECTS)** 2,5
2	**Mode of delivery / Hours per week in term:** Taught, 2 hours per week					
3	**Learning outcomes:** The students - know the basics and importance of IT security management - know the legal requirements for IT security - know the IT security standards and IT security management process - Understand IT security management according to BSI-Grundschutz, the standards and the certification process					
4	**Course contents:** - Fundamentals and significance of IT security management - Legal requirements - IT security standards - IT security management process - IT security management according to BSI basic protection - Standards and certification - Organizational aspects					
5	**Prerequisites:** None					
6	**Exam:** 60min written exam					
7	**Requirement for credits:**					
8	**Applicability of the module:**					
9	**Responsible instructor:** Hr. Wagner					
10	**Additional notes and comments:**					

Module title: Mobile and Cloud forensics						
Code ITS 32505	**Workload** 75h	**Type of Course(s)** Taught	**Semester** 7		**Duration**	**Frequency**
1	**Part(s) of the module:**		**Language** English	**Class Contact time (hours)** 30h	**Self-study time (hours)** 45h	**Credits (ECTS)** 2,5
2	**Mode of delivery / Hours per week in term:** Taught, 2 hours per week					
3	**Learning outcomes:** The students - know the special methods of forensic backup and analysis of mobile devices - are familiar with the special methods of digital forensics in the context of cloud computing Skills The students - can apply the methods of digital forensics of mobile devices and cloud systems in practice					
4	**Course contents:** - Digital forensics in the context of mobile devices (smartphones, navigation devices, etc.) - Special features in the area of forensic backup and analysis of mobile devices (operating systems, file systems, data formats, access options and restrictions) - Digital forensics in the context of cloud computing - Special features in the area of forensic protection and analysis of cloud systems (architectures, service and organizational models, trust models, access options and restrictions) - Practical applications and exercises in digital forensics of mobile devices and cloud systems					
5	**Prerequisites:** None					
6	**Exam:** 60min written exam					
7	**Requirement for credits:**					
8	**Applicability of the module:**					
9	**Responsible instructor:** Prof. Dr. Fein					
10	**Additional notes and comments:**					

Module title: Offensive Security methods						
Code ITS 24405/24410	**Workload** 225h	**Type of Course(s)** Taught	**Semester** 5		**Duration**	**Frequency**
1	**Part(s) of the module:**		**Language** English	**Class Contact time (hours)** 90h	**Self-study time (hours)** 135h	**Credits (ECTS)** 7,5
2	**Mode of delivery / Hours per week in term:** Taught, 4 hours per week lecture and 2 hours per week laboratory work					
3	**Learning outcomes:** The students - Be aware of offensive methods and their objectives in the context of IT security, including penetration testing, attacks on the confidentiality, integrity or availability of Systems, networks and channels, as well as social engineering - are aware of the legal and ethical framework in the use of offensive methods - can use current offensive methods to penetrate systems - can stabilize access to acquired systems - can identify relevant information from public sources and perform an analysis of the information surface of a target / company - Assess vulnerabilities based on CVSS and other metrics - are able to analyze code for vulnerabilities					
4	**Course contents:** - Offensive methods and their goals in the context of IT security - Legal and Ethical Framework - Fundamentals, framework conditions and goals of penetration tests - Attacks on the confidentiality, integrity or availability of >transmission channels >networks >operating systems >Applications >Hardware components >Web applications >radio systems - Finding vulnerabilities through fuzzing and code analysis Laboratory work The points dealt with in the lecture are practically tested in the internship within an isolated network. Current tools and systems from the penetration test and system analysis area such as Burp Suite, Nmap, and the Metasploit Framework					
5	**Prerequisites:** None					
6	**Exam:** Written exam 120min and ungraded laboratory work					
7	**Requirement for credits:**					
8	**Applicability of the module:**					
9	**Responsible instructor:** Prof. Dr. Bernhard Jungk					
10	**Additional notes and comments:**					

Module title: Project (Computing)

Code		Workload	Type of Course(s)	Semester		Duration	Frequency
23505/23010		225h	Project	5			
1	**Part(s) of the module:**			**Language** English	**Class Contact time (hours)** 90h	**Self-study time (hours)** 135h	**Credits (ECTS)** 7,5
2	**Mode of delivery / Hours per week in term:** Part taught, part project, 4 hours per week						
3	**Learning outcomes:** Students know: - Methods of project management - Advanced cryptographic algorithms and/or - Advanced techniques of network security and/or - Advanced techniques of the security of embedded systems						
4	**Course contents:** Independent work on a real project with the topic out of the study area, from problem analysis until the final product. This happens in a group. Teams are guided by a professor and teaching assistants.						
5	**Prerequisites:** None						
6	**Exam:** Practical work (graded), assignment (graded)						
7	**Requirement for credits:** None						
8	**Applicability of the module:**						
9	**Responsible instructor:** Prof. Nemirovski, Prof. Stauß, Prof. Morgenstern						
10	**Additional notes and comments:**						

<table>
<tr><td colspan="7">Module title: Introduction to Cyberpsychology</td></tr>
<tr><td colspan="2">Code
ITS 23460</td><td>Workload
75h</td><td>Type of Course(s)
Taught</td><td colspan="2">Semester
4</td><td>Duration</td><td>Frequency
Spring + Fall</td></tr>
<tr><td>1</td><td colspan="3">Part(s) of the module:</td><td>Language

English</td><td>Class Contact time (hours)
30h</td><td>Self-study time (hours)
45h</td><td>Credits (ECTS)

2,5</td></tr>
<tr><td>2</td><td colspan="7">Mode of delivery / Hours per week in term:
Taught, 2 hours per week</td></tr>
<tr><td>3</td><td colspan="7">Learning outcomes:
The students
- are familiar with the range of topics in cyberpsychology and the basic psychological concepts applied in cyberpsychology.
- have in-depth knowledge of the current state of research in selected topics and their interdisciplinary application areas.
- independently develop and evaluate experimental designs that are suitable for the recording and description of human behavior in cyberspace.
- are confidence in finding, in acquiring and communicating research literature and independent scientific expression.
- understand learning as a complex process that includes individual as well as social components; they have the motivation and perseverance to learn complex content and use scientific thinking approaches.</td></tr>
<tr><td>4</td><td colspan="7">Course contents:
The module "Introduction to Cyberpsychology" discusses a variety of aspects in the area of human perception, emotions, decision-making and other aspects of behavior in the context of cyberspace and online worlds. The module is of interest for students of all areas where the interaction of humans with computers plays a role. No previous knowledge of computer science or psychology is required.

Examples for topic areas covered in the module are:
- Gaming, Games and Gamification
- The human factor in IT-Security
- Cybercrime and cyber defense
- Dark Patterns, Usability, and manipulation via user interfaces
- Bio-psychological aspects of human-computer interaction (e.g. brain-computer interfaces)
- Cognitive aspects of deep fake recognition
- Generation, spread and effects of political disinformation in cyberspace
- Trust in automation and human-robot-interaction</td></tr>
<tr><td>5</td><td colspan="7">Prerequisites:
None</td></tr>
<tr><td>6</td><td colspan="7">Exam:
Written exam, 90 minutes</td></tr>
<tr><td>7</td><td colspan="7">Requirement for credits: successfully pass the written exam</td></tr>
<tr><td>8</td><td colspan="7">Applicability of the module:</td></tr>
<tr><td>9</td><td colspan="7">Responsible instructor:
Prof. Dr. Stefan Sütterlin</td></tr>
<tr><td>10</td><td colspan="7">Additional notes and comments:</td></tr>
</table>

Module title: Human Factors in IT-Security						
Code AIS 55005	**Workload** 180h	**Type of Course(s)** Taught	**Semester** 2		**Duration** 1	**Frequency** Spring semester only
1	**Part(s) of the module:**		**Language** English	**Class Contact time (hours)** 60SWS/4h	**Self-study time (hours)** 120h	**Credits (ECTS)** 6
2	**Mode of delivery / Hours per week in term:** Taught with projects and tasks, 4 hours per week					
3	**Learning outcomes:** Students know: - The foundations of human factors research in the field of IT-security. - The students are familiar with the scientific literature, incl. topic areas and methodologies. - The students know the relevant models and theories about the relationship between human perception and behavior and its implications for IT-Security Students can: - The students are able to recognize risk factors for IT-security in security-relevant socio-technical systems, to quantify them, to explain them and to provide suggestions. - The students are able to apply methods from behavioral sciences and interpret scientific results critically. - The students are able to communicate with international experts in English language and discuss related research, process the information and present to external audiences.					
4	**Course contents:** - Psychological aspects of cybercrime - Internal threats - Social Engineering - Dark Patterns - Expertise and indicators of performance typologies, profiles and motivations of perpetrators - Security awareness and interventions - Cooperation and communication of IT-security threats and incidents - Ergonomic aspects of IT-security behavior and interface design - Gamification approaches to improved IT-security behavior - Research Methods for IT-Security - Recruiting, assessment, performance monitoring, predictors of success					
5	**Prerequisites:** Bachelor students must be in year 3 or higher, as this is officially a course on Master level					
6	**Exam:** Oral exam					
7	**Requirement for credits:** Passed exam					
8	**Applicability of the module:**					
9	**Responsible instructor:** Prof. Dr. Stefan Sütterlin					
10	**Additional notes and comments:**					

Module title: Applied Cyberpsychology						
Code AIS 54505	**Workload** 180h	**Type of Course(s)** Taught	**Semester** 1		**Duration** 1	**Frequency** Winter semester only
1	**Part(s) of the module:**		**Language** English	**Class Contact time (hours)** 60 SWS / 4hr	**Self-study time (hours)** 120h	**Credits (ECTS)** 6
2	**Mode of delivery / Hours per week in term:** Taught with projects and tasks, 4 hours per week					
3	**Learning outcomes:** Students know: - The students have a broad knowledge of applications of psychological methodology and knowledge in the area of cyberpsychology. - The students have an overview of fields of applications of psychological principals and methods in the area of IT-Security, are familiar with the foundations of organizational psychological processes and decision-making in normal and critical situations. The students can: - Acquire knowledge independently by using primary scientific literature. - Critically reflect and judge theoretical and methodological aspects of recent research.					
4	**Course contents:** - Biopsychosocial concepts of perception, cognition and action - Decision-making in digital and hybrid environments - Performance under pressure - Expertise and accelerated learning - Foundations of behavior change and teaching concepts - Principles of organizational psychology - Particularities of human behavior in virtual environments and anonymity/pseudonymity - Macrocognition and group effects in online communities and social influences - Principles of neuro-ergonomics and neurocognition - Motivation, emotions and decision-making - Interdisciplinary cooperation and leadership styles, team communication					
5	**Prerequisites:** Bachelor students must be in year 3 or higher, as this is officially a course on Master level					
6	**Exam:** Oral exam					
7	**Requirement for credits:** Passed exam					
8	**Applicability of the module:**					
9	**Responsible instructor:** Prof. Dr. Stefan Sütterlin					
10	**Additional notes and comments:**					

Degree program Food, Nutrition, Hygiene
Module: Food Technology

Key facts

Workload	**Semester**	**Frequency**	**ECTS**
150 h	3	Every semester	5
Parts of the module		**Contact time**	**Self-study time**
		60 h	90 h
Module leader		**Assessment**	
Prof. Dr. C. Gerhards		Poster presentation, Oral exam	

Curriculum Outline
Students know how food is composed. They learn how molecular properties influence the physical and chemical properties of foodstuffs. They are informed, how food is being processed, involving their knowledge about molecular properties of food.

Key content
- Water in food, water activity
- Properties of sugars and carbohydrates
- Sugar beet processing
- Baking, frying
- Properties of proteins
- Meat, meat products, milk, cheese
- Properties of fats and oils
- Oil seeds processing
- Gums and Stabilizers

Degree program Food, Nutrition, Hygiene
Module: Human Nutrition - Basics

Key facts

Workload	**Semester**	**Frequency**	**ECTS**
150 h	4	Every semester	5
Parts of the module		**Contact time**	**Self-study time**
Self-directed learning course consists of • self-study material • personal guidance and support		1,5 h introduction 3,0 h support 1,5 h feedback	144 h
Module leader		**Assessment**	
Prof. Dr. Astrid Klingshirn		Research paper	

Curriculum Outline
Self-directed learning course on Human Nutrition. The emphasis of this course is on selected public health nutrition aspects, such as food policy, regulatory issues, challenges to the global food supply …, with relevance for students majoring in food related subjects.

Key content
- Introduction to Human Nutrition: A Global Perspective on Food and Nutrition
- Food Composition
- Physical Activity: Concepts, Assessment Methods and Public Health Considerations
- Nutrition Research Methodology
- Food and Nutrition: Policy and Regulatory Issues
- Food and Nutrition-Related Diseases

Degree program Food, Nutrition, Hygiene
Module: Physical Food Analysis

Key facts

Workload	**Semester**	**Frequency**	**ECTS**
75 h	6	Every semester	2,5
Parts of the module		**Contact time**	**Self-study time**
0,5 contact hour lecture 1 contact hour practical training		15 h	52,5 h
Module leader		**Assessment**	
Prof. Dr. A. Klingshirn		Term paper	

Curriculum Outline
The module covers the theory of as well as practical training in various analytical techniques used in modern physical analysis of food ingredients and processed foods.

Key content

- Physical food properties in focus include water activity, moisture, colour, viscosity, weight, thickness and texture. The analysis parameters act as crucial indicators of food quality and safety.
- In an introductory practical session different physical analysis methods are presented and trained.
- Based on a specific task form food processing, food quality evaluation or benchmarking, relevant physical food analysis parameters are to be defined and a measurement program, specifying the different physical analysis methods, is to be set- up. The physical analysis results will additionally be correlated with sensory analysis methods. As physical properties of a product drive consumer perception and desirability for the product, establishing ideal physical properties is essential in the decision-making process for product developers, marketers and quality controllers.

Degree program Food, Nutrition, Hygiene
Module: Food Development

Key facts

Workload	**Semester**	**Frequency**	**ECTS**
75 h	6	Every semester	2,5
Parts of the module		**Contact time**	**Self-study time**
1 contact hour tutorial 1 contact hour practical training		15 h	52,5 h
Module leader		**Assessment**	
Prof. Dr. A. Klingshirn		Poster presentation	

Curriculum Outline
Continuous product development is a crucial success factor in food industry, from refining of an established product range to developing completely new products.

Key content

- The tutorial provides an introduction and insight to the core elements of product development, namely the business strategy directing product development, the various steps in the product development process based on the 'Stage- Gate- Process', the knowledge required to fuel the process and the need for keeping the product development focused on the consumers needs.
- A focus is placed on the product development process, from ideation to product launch, focusing on the small scale bench development phase. Critical aspects in managing the product development process in practice are covered, including process evaluation and improvement techniques to allow for successful product innovation.
- In the practical training, performed as a collaborative work, a new food product will be developed from concept to prototype or pilot-scale production, with inclusion of a critical analysis of product quality, safety, shelf-life, packaging, labelling (nutrient content calculation, legal aspects) and cost.
- A presentation of the development process outcome (from ideation to the final product) and the product specification, including aspects of, market accessibility and consumer acceptability is given.

Degree program Food, Nutrition, Hygiene
Module: Applied Sensory and Consumer Science

Key facts

Workload	**Semester**	**Frequency**	**ECTS**
150 h	6	Every semester	5
Parts of the module		**Contact time**	**Self-study time**
2 contact hours lecture 1 contact hour tutorial 1 contact hour practical training		60 h	90 h
Module leader		**Assessment**	
Prof. Dr. Corinna Hempel		Presentation & term paper	

Curriculum Outline
Understanding food choices is of fundamental importance for product development/improvement. Sensory & consumer science can help to understand some of the key factors influencing food choices. This course focuses on real-world expertise and explores new techniques, as well as the foundational theory behind current methods of sensory evaluation & consumer science for both edible and non-edible products.

Key content
- Physiological and psychological bases for sensory evaluation and consumer testing;
- Applied methods and statistical tools that can be used for collecting and extracting useful information from sensory and consumer data, current business applications;
- Theories and approaches used in the execution of sensory evaluation and consumer testing research;
- Recent advances in cognitive psychology applied to sensory and consumer studies on food, beverage, cosmetic, personal care and hygiene products;
- Applied research techniques in sensory and consumer testing along the whole product life cycle (trend research, early prototyping, validated concept proof, final sensory and consumer validation, storage testing);
- A consumer view to food packaging & sustainability.

Degree program Food, Nutrition, Hygiene
Module: Sustainable Packaging Technology

Key facts

Workload	**Semester**	**Frequency**	**ECTS**
75 h	7	Every semester	2,5
Parts of the module		**Contact time**	**Self-study time**
1 contact hours lectures 0,5 contact hour seminars 0,5 contact hour workshops		30 h	45 h
Module leader		**Assessment**	
Prof. Dr. Markus Schmid		Oral exam (English or German)	

Curriculum Outline
This seminar presents a basic overview of food packaging technology with emphasis on packaging sustainability.

Key Content

- Food packaging as a scientific discipline that applies the principles of materials science, food technology, information science, and socioeconomics to develop useful and packaging concepts for the food industry will be introduced.
- In addition to that, a holistic approach for considering sustainability aspects in food packaging technology will be introduced.
- The students will learn to apply the theoretical basics of packaging production and functionality in several workshops.
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Degree program Food, Nutrition, Hygiene
Module: Hygiene and Environmental Health

Key facts

Workload	**Semester**	**Frequency**	**ECTS**
75 h	7	Every semester	2,5
Parts of the module		**Contact time**	**Self-study time**
1 contact hours lectures 0,5 contact hour seminars 0,5 contact hour workshops		30 h	45 h
Module leader		**Assessment**	
Prof. Dr. Benjamin Eilts		Presentation & term paper	

Curriculum outline

Since hygiene as a science considers all factors that influence human health, the interrelationships between humans and their environment are also in focus. Microorganisms (bacteria, viruses, fungi and parasites) exist naturally in the environment and on or within the bodies of animals and people. There are other sources of microorganisms that may cause infection and these include a person's own normal microbial flora and environmental sources such as air, water, or equipment that may have become contaminated.

Key Content

- Based on selected areas, the influence of microorganisms and suitable countermeasures are discussed with the help of current specialist literature. The aim is to gain comprehensive knowledge of the literature on the selected topic and to interpret the literature data in terms of their application and to discuss interfaces to other, subject-related aspects (e.g. regulatory framework conditions, market requirements, occupational safety).
- The requirements and measures in the areas of monitoring, hygienic design and decontamination are deepened through additional lab exercises.

Degree program Food, Nutrition, Hygiene
Module: Customer Centric Design

Key facts

Workload	**Semester**	**Frequency**	**ECTS**
75 h	7	Every semester	2,5
Parts of the module		**Contact time**	**Self-study time**
1 contact hour tutorial 1 contact hour practical training		30 h	45 h
Module leader		**Assessment**	
Prof. Dr. A. Klingshirn Prof. Dr. B. Eilts		Term paper	

Curriculum Outline
The course focuses on the "Customer Centricity" approach in product development, which sees the consumer instead of the products as the starting point for new developments and starts with the needs and wishes of consumers in all areas from product design, marketing and sales.

Key content

- Insight into options on the procedure for customer-oriented product development that involves the consumers at all levels - in the product development itself and in the use phase - mostly via ethnographic analyzes (e.g. focus groups, home visits, netnography or diary studies) are presented in the areas of appliance technology, hygiene and cleaning technology and in the area of supply services.
- The focus is on deriving concrete innovations and product optimization based on customer needs and the customer experience.
- Possible contents include: The identification of typical usage scenarios of home appliances / food service design and processes in food preparation or cleaning, the analysis of the actual use cases and misuses, the analysis of customer expectations and also the uncovering of "hidden needs".

Degree program Food, Nutrition, Hygiene
Module: Research Project

Key facts

Workload	**Semester**	**Frequency**	**ECTS**
150 h	5th , 6th or 7th semester	Every semester	5
Parts of the module		**Contact time**	**Self-study time**
Research project		7,5 h	142,5 h
Module leader		**Assessment**	
Various professors		Term paper or poster and presentation	

Curriculum Outline
The research project is an in-depth study of an issue or topic from all fields related to food (food technology, food processing, packaging, process control, quality management,…), nutrition, appliance technology and hygiene. It may be in the form of a small-scale research study, a case study, a program evaluation or a report on a field placement.

Key content
may cover…

- an analysis of an existing data set in order to test a hypothesis or answer a research question;
- a critical systematic review of a question such as the effectiveness of a policy or intervention;
- an evaluation of the implementation of a new technology in food/ nutrition / hygiene-related industry;
- a small research study, in which data is collected and analyzed.
  The report and presentation shows the abilities of …
- systematically collecting relevant, up-to-date information about the research task;
- analyzing, interpretation and discussion of the information;
- drawing conclusions and making recommendations;
- writing a report in accordance with academic standards.

Degree program Food, Nutrition, Hygiene
Module: Health and Nutrition Psychology

Key facts

Workload	**Semester**	**Frequency**	**ECTS**
75 h	7	Every semester	2,5
Parts of the module		**Contact time**	**Self-study time**
2 contact hours lecture		30 h	45 h
Module leader		**Assessment**	
Prof. Dr. A. Maier-Nöth		oral exam	

Curriculum Outline
The course focuses on understanding the interactions between body, psyche and socio-cultural factors with the help of scientifically based approaches: How do psychological factors influence eating behavior? How do eating disorders arise, how can they be prevented or cured? How can you guide people to healthy eating habits and thus avoid diet-related diseases?

Key content

- Insights to the experience and behavior of people in relation to their health and nutrition and understand the influencing factors.
- Conveying the psychological understanding of human perception, cognition, emotion and social interaction on the character of eating behavior (intuitive eating, emotional eating, ...).
- Health and nutritional psychology case studies
- Analysis of societal norms and values on eating behavior.
- Nutritional education as an essential part of health and nutritional psychology.
- Planning, organization, implementation and evaluation of target group-specific, nutritional intervention measures.

Degree programme: Pharmaceutical Engineering
Module: Sterile Technology

Key facts:

Workload		**ECTS**
150 h		5
Parts of the module	**Contact time**	**Self-study time**
4 contact hour lecture including exercises and 2 practical training sessions	60 h	90 h
Module leader	**Assessment**	
Prof. Dr. A. Schmid	Written exam, presentation and practical training	

Curriculum Outline
The module is focussing on the manufacture of sterile pharmaceuticals. The participants gain broad practical knowledge about sterilization processes (including validation), aseptic processing conditions and the associated technologies, aseptic transfer and filling, and hygienic design of facilities and machinery. Additional exercises and practical training (focussing on validation of aseptic processes and visual inspection) prepare the participants for future tasks in sterile manufacturing.

Key content
Sterilization:
- Sterility testing
- Basic concepts, e. g. SAL, D value, z value, F_0 value
- Technical aspects of sterilization procedures: steam, heat, radiation, chemical, plasma sterilization, sterile filtration
- Validation of sterilization processes

Aseptic Processing:
- Environmental requirements / cleanrooms, class A technologies (isolators, RABS etc.)
- Preparation / washing, CIP / SIP, transfer processes
- Sterile filling and packaging (fill & finish)
- Validation / media fill, quality control / inspection Hygienic

design / sterile design:
- Materials, surfaces, components
- Sterile design using the bioreactor as an example

Degree programme: Pharmaceutical Engineering
Module: Comprehensive Biotechnology

Key facts:

Workload		**ECTS**
150 h		5
Parts of the module	**Contact time**	**Self-study time**
2 contact hour lecture 2 contact hour seminar	60 h	90 h
Module leader	**Assessment**	
Prof. Dr. D. Stoll	Written exam, term paper and oral presentation	

Curriculum Outline
The module covers the workflow in state-of-the art production of biologics. Concepts of the upstream process, knowledge in kinetics and process management are important parts of the course. Furthermore the isolation of biologics API in the downstream process is the second main focus of the course.

Key content

- Upstream Processing (USP):
  - Biopharmaceuticals / the biopharmaceutical process based on antibody production
  - Expression Systems, Process Control, Equipment, Calculation Basics, Case Studies
- Downstream processing (DSP):
  - Common DSP Technologies: cell disruption, filtration, chromatography (ion exchange, size exclusion, hydrophobic interaction, affinity).
- E-poster with presentation - creation, presentation and reflection of an e-poster on a biopharmaceutical / biotechnological product and its manufacture
- Journal Club: short oral presentation of major outcomes described in scientific papers on biotechnology topics.

Degree programme: Pharmaceutical Engineering
Module: Galenics of Biopharmaceuticals

Key facts:

Workload		**ECTS**
150 h		5
Parts of the module	**Contact time**	**Self-study time**
2 contact hour lecture 2 contact hour practical training	60 h	90 h
Module leader	**Assessment**	
Prof. Dr. I. Müller	Presentation and practical training	

Curriculum Outline
Students know galenic principles of biopharmaceuticals. They know the specific characteristics of biopharmaceuticals as well as the main principles of research and development. They are informed how biopharmaceuticals are being processed.

Key content

- Characteristics and groups of biopharmaceuticals
- Characteristics, manufacturing processes and quality control of lyophilized products, micro- and nanoparticles, liposomes and special semis-solids, therapeutic systems, vaccines, inhalers
- Stability studies

Degree programme: Pharmaceutical Engineering
Module: Modern Pharmaceutical Analytics

Key facts:

Workload		**ECTS**
75 h		2,5
Parts of the module	**Contact time**	**Self-study time**
1,5 contact hour lecture 0,5 contact hour exercise	30 h	45 h
Module leader	**Assessment**	
Prof. Dr. D. Stoll	Oral exam	

Curriculum Outline
The module covers aspects of modern analytics in pharmaceutical research and industry. Mainly techniques applied in biomarker identification and bioanalytics are presented. Furthermore exercises in GxP compliant analytical validation of simple assays and data sets are performed.

Key content

- HPLC-ESI-mass spectrometry of small drug molecules and metabolites in pharmacokinetics
- ESI-MS mass spectrometry of biologics (antibodies, QC) and peptides (QC, proteomics)
- Multiplex Immunoassays in biomarker research
- ICH and EMA guidelines. Exercises: Definition of simple validation plans + data statistics and interpretation

Degree programme: Pharmaceutical Engineering
Module: Pharmaceutical Technology 2

Key facts:

Workload		**ECTS**
75 h		2,5
Parts of the module	**Contact time**	**Self-study time**
2 contact hour seminar	30 h	45 h
Module leader	**Assessment**	
Prof. Dr. K. Köhler	Presentation	

Curriculum Outline
The module covers various fields of pharmaceutical technology research as well as manufacturing topics, always in respect to pharmaceutical industrial processes.

Key content
Current topics in GMP-compliant pharmaceutical production and related areas

Degree programme: Pharmaceutical Engineering
Module: Research project

Key facts:

Workload		**ECTS**
150 h		5
Parts of the module	**Contact time**	**Self-study time**
0.5 contact hour project	7.5 h	142.5 h
Module leader	**Assessment**	
Professors Pharmaceutical Engineering	Team paper and oral presentation	

Curriculum Outline
The research project is an in-depth study of an issue or topic from all fields related to the pharmaceutical development and production including packaging, process control, quality management,…). It may be in the form of a small-scale research study, a case study, a program evaluation or a report on a field placement.

Key content
may cover…

- an analysis of an existing data set in order to test a hypothesis or answer a research question;
- a critical systematic review of a question such as the effectiveness of a policy or intervention;
- an evaluation of the implementation of a new technology in pharmaceutical related industry;
- a small research study, in which data is collected and analyzed. The report and presentation shows the abilities of
    - systematically collecting relevant, up-to-date information about the research task;
    - analyzing, interpretation and discussion of the information;
    - drawing conclusions and making recommendations;
    - writing a report in accordance with academic standards.

Master level

(Courses are only offered once a year, please check the entry in the column “Sem.”)

Sigmaringen campus:

Lecturer	Title	Code	Credits	Sem.
To be determined (all professors from LS)	Innovation project	FPD57010	5 ECTS	M.Sc. spring / winter semester
Prof. Klingshirn Prof. Gerhards	Technology and Innovation Management: Novel food processing technologies, introduction in innovation management, focusing on ideation and idea selection process in food and pharma industry	FPD57500	5 ECTS	winter sem.