HSLU Lucerne University of Applied Sciences and Arts

School of Engineering and Architecture

Undergraduate modules in English for Engineering Students

Timetables Academic Year 2023/24

Also valid as orientation for Academic Year 2024/25

FH Zentralschweiz

Introduction

University
The Lucerne University of Applied Sciences and Arts with its Schools of Engineering and Architecture, Business, Computer Science, Social Work, Art and Design, and Music offers an excellent academic and practice-based learning programme to help students achieve their career objectives – all provided in state-of-the-art facilities in a stunning city within a hub of European innovation and achievement.

Campus
The Lucerne School of Engineering and Architecture in Horw is the central hub of the Construction and Engineering areas of specialization. The collaboration among the nine Institutes offers ideal conditions for interdisciplinary learning, research and development on the solution-centered path into the future.

Bachelor's degree programmes
Our campus is home to eleven applied degree programs in the fields of Engineering and Information Technology as well as Architecture and Construction. This setting is conducive to all forms of interdisciplinary collaboration.

COIL
COIL stands for „Collaborative Online International Learning". Here, students and lecturers from two international institutions work together virtually over a period of 3-4 weeks. They get to know different professional and cultural perspectives and at the same time expand their virtual teamwork skills. COILs may be applied in some of our modules.

Undergraduate modules in English for Engineering Students
International exchange students can choose from a variety of modules to create a timetable that meets their own needs and the requirements of their home university. Modules can be taken from our Bachelor's degree programmes in:

- Building Technology | Energy,
- Electrial Engineering and Information Technology,
- Mechanical Engineering,
- Digital Engineering,
- Medical Engineering,
- Busines Engineering | Innovation,
- Energy and Envionmental Systems Engineering,

and complementary from:

- the Institute for Natural Sciences and Humanities,
- the Language Center, and
- the School of Computer Science.

Presentation as timetables
All modules are presented in timetables stating days and times. For each module, the offering Bachelor's programme, an internal code, the type, the level, the number of credits, and a short description are also displayed.

Minimum credits
From this selection, individual timetables with up to 30 credits (ECTS) can be compiled for each semester. The final module selection is subject to the learning agreement approved by the head of the study program and facilitated by the exchange coordinators. International exchange students must complete a minimum of 15 credits (ETCS) per semester.

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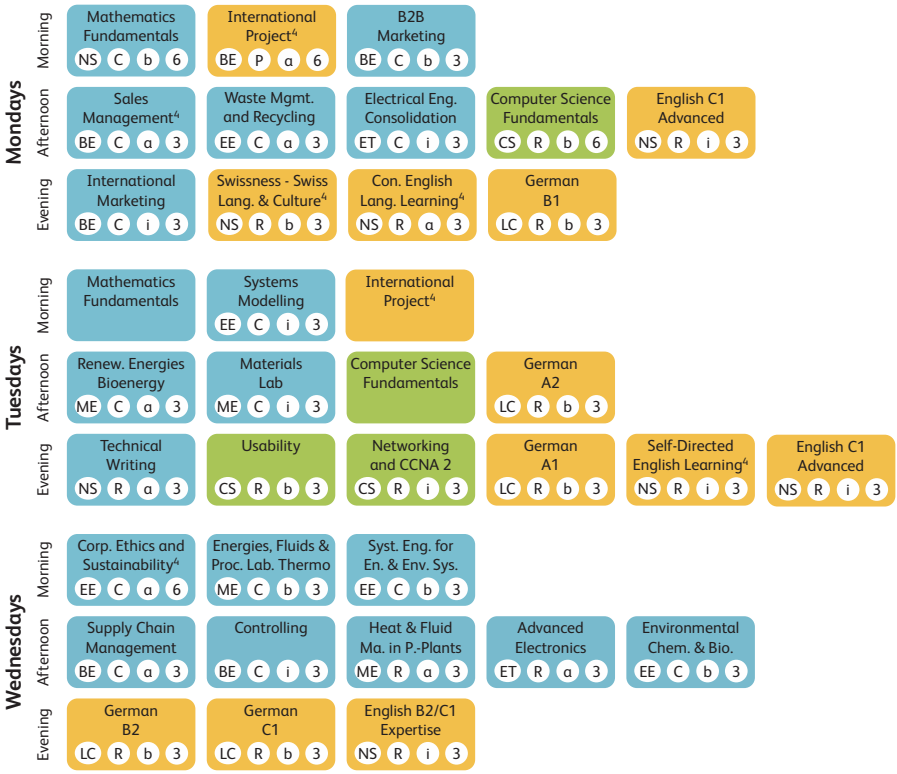
Vibrant campus of the
School of Engineering and Architecture

Autumn semester 2023/24
Overview

Start of contact studies:	Monday, 18 September 2023
End of contact studies:	Friday, 22 December 2023
Christmas break:	Saturday, 23 December 2023 - Tuesday, 2 January 2024
Exams:	Monday, 15 January - Saturday, 3 February 2024
Intensive weeks:	Monday, 2 September - Saturday, 14 September 2024, and Monday, 5 February - Saturday, 17 February 2024



Eligibility
- Disciplinary module for all Engineering students
- Interdisciplinary or Language module for all students
- Module from School of Computer Science

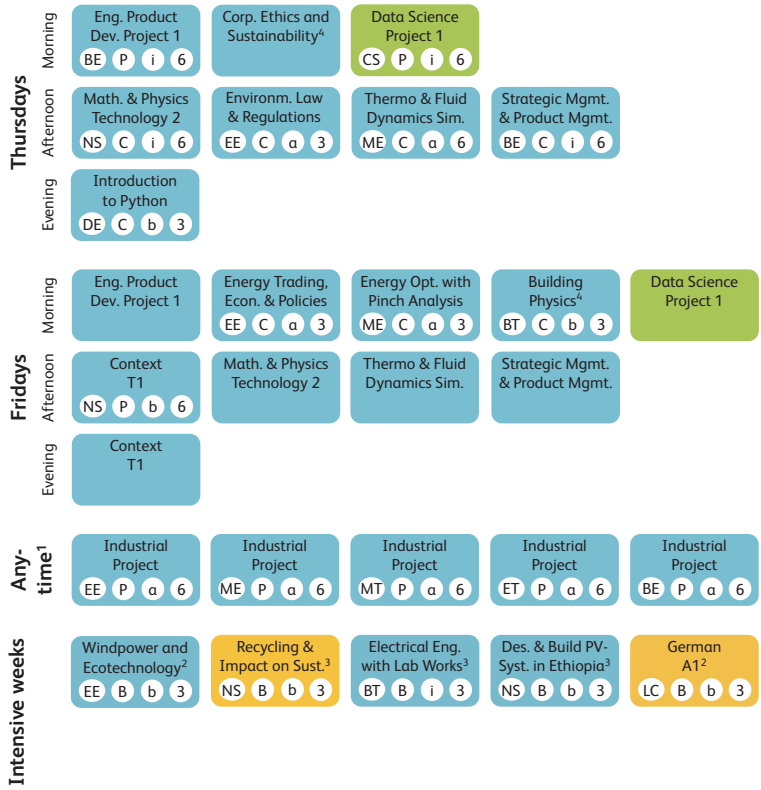
Bachelor programme / Host
- BE Business Engineering I Innovation
- BT Building Technology I Energy
- EE Energy and Environmental Systems Engineering
- DE Digital Engineering
- ET Electrical Engineering and Information Technology
- ME Mechanical Engineering
- MT Medical Engineering
- NS Natural Sciences and Humanities
- CS Departement of Computer Science
- LC Language Center

Module type
- B Block (Intensive weeks)
- C Core (Mandatory in host study programme)
- P Project
- R Related (Elective in host study programme)

Module level
- b basic (First year)
- i intermediate (Second year, some prerequisites)
- a advanced (Final year, prerequisites)

Module credits (One semester = 30 ECTS)
- 3 Lessons once a week or one intensive week
- 6 Lessons twice a week
- 12 Lessons up to four times a week

Superscripted numbers
- 1 By individual agreement
- 2 Two weeks before start of spring semester
- 3 Week before start of spring semester
- 4 COIL may apply



Autumn semester 2023/24
Mondays

Mondays mornings	**Internal code**	**Host**	**Type**	**Level**	**Credits**
Business-to-Business Marketing	TA.BA_IGM_E	BE	C	b	3
Mathematics Fundamentals	TA.BA_MATH	NS	R	b	6
International Project	TA.BA_INTPRO	BE	P	a	6
English C1 Advanced	TA.BA_CAE_SZ	NS	R	i	3
Mondays afternoons					
Computer Science Fundamentals	I.BA_CSF	CS	R	b	6
Electrical Engineering Consolidation	TA.BA_ET+V	ET	C	i	3
Sales Management	TA.BA_SALES_E	BE	C	a	3
Waste Management and Recycling	TA.BA_WASTE_E	EE	C	a	3
Mondays evenings					
International Marketing	TA.BA_INTMA_E	BE	C	i	3
Swissness - Swiss Language & Culture	TA.BA_SWISS_ISA	NS	R	b	3
Connected English Language Learning	TA.BA_PEAK	NS	R	i	3
German B1	W.SZ_DEUFF_B1	LC	R	b	3

Module descriptions and persons in charge:

Business-to-Business Marketing

Angelos Apostolidis

Basics, meaning and delimitation of industrial goods marketing. Learning and applying the relevant concepts and marketing characteristics in the field of industrial goods. Development, discussion, and application of the essential instruments for this purpose with a focus on the three central perspectives for determining a comparative competitive advantage as well as the four essential business typologies for the product, plant, system, and supplier business.

Mathematics Fundamentals

Dr. Michael BÄCHTHOLD

Communication of the basics of differential and integral calculus (limits, continuity, convergence, differential quotient, integration), identification of derivation and integration rules (product, quotient and chain rule, partial integration, partial fraction resolution), handling function graphs (monotony, extreme points, zero points, turning points, curvature), handling applications (optimization problems, area and volume calculations), series concepts.

International Project

Prof. Dr. Christine GRIMM

Hands-on introduction to the Design Thinking method. Execution of a design project within a team, solving a real life challenge provided by an industry partner. Application and deepening of problem solving, project management and professional competencies. Creation of convincing scientific documentation and presentation of the results.

English C1 Advanced

Tina BRØDSGAARD

Expanding vocabulary and grammar skills and improving listening and reading comprehension to English C1 Advanced level. In addition, oral and written expression is refined. In addition, strategies for mastering the standardized English C1 Advanced task types are acquired.

Computer Science Fundamentals

Prof. Dr. René MEIER

Introduction to computer science, Internet, ERP systems, development of information systems, computer architectures and operating systems, basics of programming, object-oriented programming, software development, information security, artificial intelligence, databases.

Electrical Engineering Consolidation

Prof. Dr. Jonas MÜHLETHALER

Deepening the fundamentals of electrical engineering thanks to the integration of mathematics knowledge for the development of more realistic models. Investigation of more extensive linear circuits for direct and sinusoidal alternating current. Examination of non-linear effects using magnetic circuits.

Sales Management

Angelos APOSTOLIDIS

The sales management module covers the understanding of sales organizations and teaches the processes for managing and motivating sales staff, as well as how to measure and optimize their success. You will learn how to set appropriate goals, develop suitable sales strategies, and select effective and efficient instruments. You will learn to understand important features of sales psychology. This includes the coordination of processes as well as the application of essential ...

Waste Management and Recycling

Dr. Martin STREICHER-PORTE

The Waste management and recycling course will give insight to the generation, collection, treatment, deposition and recycling of main waste categories. The existing management systems and applied technologies are analysed and evaluated. Crucial processes such as anaerobe digestion & composting, final disposal, thermal treatment, sorting & separation techniques, material recycling and energy recovery are covered. Waste categories which are not yet explicitly ...

International Marketing

Prof. Dr. Sascha GÖTTE

The importance of international marketing for companies being active in today's business environment, assessment of the international environment, the importance of cultural diversity, development of international marketing strategies and marketing instruments, management and organization of international marketing activities, application in case studies, and in a cloud-based business simulation in teams.

Swissness -Swiss Langaue & Culture

Dr. Nina ZIMNIK

Communication of skills for understanding Swiss politics, economy, society, language and culture; support of integration and student abilities; development of intercultural tolerance; application and further development of oral communication methods.

Connected English Lang. Learning

Franz HAGMANN

Focus on fostering English skills (from level B2/FCE onwards); distinction of English pronunciation and development of communication skills while taking into account intercultural issues and a specific target area.

German B1

Dr. Isanna MENDE

The module is aimed at non-German-speaking students with German language skills of at least level A2. Students who successfully complete the module can understand non-fiction texts on concrete and abstract topics, write coherent texts on topics of general interest and from their own area of interest, hold a conversation on familiar topics relatively fluently and without preparation.

Autumn semester 2023/24
Tuesdays

Tuesdays mornings	**Internal code**	**Host**	**Type**	**Level**	**Credits**
Mathematics Fundamentals	(continued)				
International Project	(continued)				
Systems Modelling	TA.BA_SYSM_E	EE	C	i	3
Tuesdays afternoons					
Renewable Energies - Bioenergy	TA.BA_EE+BIO_E	ME	C	a	3
Materials Lab	TA.BA_M_LAB	ME	C	i	3
Computer Science Fundamentals	(continued)				
German A2	W.SZ_DEUFF_A2	LC	R	b	3
Tuesdays evenings					
Technical Writing	TA.BA_TECW	NS	R	a	3
Usability	I.BA_USAB	CS	R	b	3
Networking and CCNA 2	I.BA_NETW2_E	CS	R	i	3
German A1	W.SZ_DEUFF_A1	LC	R	b	3
Self-Directed English Learning	TA.BA_SELL	NS	R	i	3

Module descriptions and persons in charge:

Systems Modelling

Dr. Matthias BERGER

Fundamentals of mathematical description of systems and introduction of modelling tools. Students learn how to describe mathematically a system (linear models), as well as how to implement and solve the system in e.g. MATLAB and Python. The basics from system thinking and engineering will be applied in practical examples.

Renewable Energies - Bioenergy

Prof. Dr. Thomas NUSSBAUMER

Examination of the technology required to use biomass as an energy source, such as combustion to generate heat, gasification to produce energy and fermentation into biogas. Overview of the principles of electricity generation and combined heat and power. Laboratory visit on measures for reducing pollutants in combustion plants. Profitability calculations for determining the heat and electricity generation costs.

Materials Lab

Priska HERZOG

Introduction to Material Science and Engineering: Understand the structure and basic properties of materials, know how to derive properties by testing, understand test procedures and evaluations, able to assess aspects of material selection. Overview of the lifecycle of all relevant materials in Energy System engineering and their ecological footprint in production, use and end of life.

German A2

Dr. Isanna MENDE

The module is aimed at non-German-speaking students with German language skills of at least level A1. Students who successfully complete the module understand and use sentences and frequently used expressions. Students can communicate in simple situations involving a direct exchange of information. One can describe one's own origin, education and immediate surroundings in context.

Technical Writing

Prof. Irene DIETRICHS

Individual coaching of students writing their academic technical report for an industrial project at English level C1-C2; inputs and exercises for the expansion and consolidation of academic writing skills such as structure and organization of reports, discussion of one's own and cited research findings, integration of graphics and data; academic and discipline-specific technical vocabulary and conventions.

Usability

Armin EGLI

The human being in direct interaction with systems, definitions of usability and user experience, Human Centered Design - process and its integration into a general project approach, GUI design, different interaction elements, usability and quality, usability and accessibility, usability and special technologies (e.g. AR/VR, hardware ...).

Networking and CCNA 2

Prof. Dr. Urs RÖTHLISBERGER

The basics of networking (VLAN, ACLs, NAT, STP, EtherChannel) and routing (OSPF, EIGRP) as well as services (streaming, multicasting) are taught and practically tested in laboratory set-ups. The ICND1 industry exam lays the foundations for all network activities.

German A1

Dr. Isanna MENDE

The offer is aimed at non-German speaking students - beginners. The learning progress in this module is considerable. The offer is therefore tailored to motivated students.

Self-Directed English Learning

Franz HAGMANN

Focus on fostering English language skills from level B2/FCE onwards; communication of language learning techniques based on specialist texts, with the goal of continually and independently improving individual language skills.

Autumn semester 2023/24
Wednesdays

Wednesdays mornings	**Internal code**	**Host**	**Type**	**Level**	**Credits**
Corporate Ethics and Sustainability	TA.BA_CE_SB	EE	C	a	6
Energies, Fluids & Processes Lab Thermo	TA.BA_EFPLAB2_E	ME	C	b	3
Systems Engineering for Energy & Environmental Systems	TA.BA_SE_EES	EE	C	b	3
Wednesdays afternoons					
Supply Chain Management	TA.BA_SCM_E	BE	C	a	3
Controlling	TA.BA_CON_E	BE	C	i	3
Heat & Fluid Machinery in Power Plants	TA.BA_HFMPP	ME	R	a	3
Advanced Electronics	TA.BA_AE	ET	R	a	3
Environmental Chemistry and Biology	TA.BA_ENCHEBIO	EE	C	b	3
Wednesdays evenings					
German B2	W.SZ_DEUFF_B2	LC	R	b	3
German C1	W.SZ_DEUFF_C1	LC	R	b	3
English B2/C1 Expertise	TA.BA_EEXP	NS	R	i	3
English C1 Advanced	TA.BA_CAE_SZ	NS	R	i	3

Module descriptions and persons in charge:

Corporate Ethics and Sustainability

Prof. Dr. Claas WAGNER

Fundamentals of Business Ethics (BE) and Corporate Responsibility (CR) for practical use in different management positions. Based on case studies, students learn how to get in contact with practitioners and exchange experiences. Basic and well-grounded overview about BE / CR and central concepts, the empirical situation, theoretical discussion and the implementation in management practice. Students will apply gained knowledge in an energy-related simulation game ...

Energies, Fluids & Processes Lab 2

Prof. Dr. Mirko KLEINGRIES

Further development of the basics of energy technology. Handling of more complex energy conversion processes and machines according to laboratory tests (e.g. Pelton turbine, piston compressor, fuel cell). Consolidation of the fundamentals of energy technology. Handling of complex energy conversion processes and machines based on laboratory tests (pelton turbine, heat pump, combustion process).

Systems Eng. for Energy & Env. Syst.

Macarena San Marin RUIZ

Introduction to the design and management of complex systems over their life cycles. Appropriate delimitation of systems. Illustration of the complexity of energy and environmental systems. Possibilities to structure systems and to reduce complexity of systems.

Supply Chain Management

Fabio MERCANDETTI

Introduction to the Supply Chain of industrial companies, through examples from various businesses, analysis and discussion of business cases, including the use of Supply Chain simulations. Starting with a high-level view of the Supply chain across several tiers, then analysing in detail the Logistic activities in a company. Moving to Sourcing strategies and tools for strategic and operational Purchasing, Ending with Production, Costing, Risk management and Sustainability.

Controlling

Prof. Dr. Michael BLANKENAGEL

Understanding business, investment budgeting, controlling along the value chain, management information.

Heat & Fluid Mach. in Power Plants

Dr. Sabri DENIZ

Fundamentals, basic components, classification, operating principles, and applications of heat- and fluid machines, including volumetric (positive displacement) machines, pumps, compressors, gas- steam- hydro- and wind turbines, pump turbines, heat pumps, and combined heat & power units. Calculation of the losses in pipelines and piping system elements, knowledge of the characteristics of the heat- and fluid machines (especially pumps) and operation of these ...

Advanced Electronics

Prof. Rolf METTLER

Analysis of advanced concepts for analog electronic circuit technology with practical tasks. Development of circuits, such as ECG measuring instruments, streaming current detectors, light fluctuation detectors, ultrasound hearing aids, TOF etc.

Environmental Chemistry & Biology

Samuel TANNER

Introduction into environmental chemistry and biology. Major charateristics of the five spheres of Earth's environment: geo-, hydro-, atmo-, bio- and anthrosphere supplemented by laboratory experiments. Categories of hazardous substances and their interaction with the spheres. Estimation of important aspects of selected pollutants. Inclusion of current environmental issues.

German B2

Dr. Isanna MENDE

The module is aimed at non-German-speaking students with German language skills of at least level A1. Students who successfully complete the module understand and use sentences and frequently used expressions. Students can communicate in simple situations involving a direct exchange of information. One can describe one's own origin, education and immediate surroundings in context.

German C1

Yaël BORNSTEIN

In addition to refreshing, consolidating and expanding grammar and vocabulary, the module provides ample opportunity for presentation and writing learning as well as for conversation and exchange on social, personal, political, professional, cultural and study-related topics. The teaching varies each semester, according to the current needs of the students.

English B2/C1 Expertise

Prof. Irene DIETRICHS

Discussions on current topics, reading of authentic texts, diverse listening comprehension exercises and in-depth vocabulary expansion – together with effective learning strategies. Communication on an advanced level, with fluent, correct and effective expression in both written and verbal form. Preparation for the Cambridge Advanced Certificate.

English C1 Advanced

Tina BRØDSGAARD

Expanding vocabulary and grammar skills and improving listening and reading comprehension to English C1 Advanced level. In addition, oral and written expression is refined. In addition, strategies for mastering the standardized English C1 Advanced task types are acquired.

Autumn semester 2023/24
Thursdays

Thursdays mornings	**Internal code**	**Host**	**Type**	**Level**	**Credits**
Engineering Product Development Project 1	TA.BA_PDP1	BE	P	i	6
Data Science Project I	I.BA_DSPRO1	CS	P	i	6
Corporate Ethics and Sustainability	(continued)				
Thursdays afternoons					
Mathematics & Physics Technology 2	TA.BA_MA+PHY2_T	NS	C	i	6
Environmental Law and Regulations	TA.BA_ELR_E	ME	C	a	3
Strategic Management & Product Management	TA.BA_SM+PM	BE	C	i	6
Thermo and Fluid Dynamics Simulation	TA.BA_THFL+SIM	ME	C	a	6
Thursdays evenings					
Introduction to Python	TA.BA_PYTHON	DE	C	b	3

Module descriptions and persons in charge:

Eng. Product Development Project 1

Prof. Dr. Simon ZÜST

Engineering project: Experiencing the development of a product in an interdisciplinary team. Elaboration of market and product requirements; developing, evaluating and verifying engineering solution concepts while taking into account common methods for finding ideas and solutions. Set-up of suitable basic tests and prototypes for proof of concept.

Data Science Project 1

Dr. Umberto MICHELUCCI

This course equips students to build comprehensive data science and machine learning solutions. Initially, students select a project to focus on and then proceed to create an end-to-end solution. The educational approach blends lectures with individual coaching, enabling students to acquire industry-relevant skills. Topics range from data science fundamentals to model validation, managing skewed datasets, crafting scientific presentations, and...

Mathematics & Physics Technology 2

Prof. Dr. Thomas GRAF

Handling of partial derivations and total derivation, plus basics of probability theory and descriptive statistics. Understanding of parameters and distributions. Teaching of microscopic-mechanical aspects of heat and temperature. Study of oscillations and waves.

Environmental Law and Regulations

Markus SCHREIBER

Energy and environmental systems are governed by numerous laws and regulations that serve the protection of the environment. This course covers the areas of environmental law that are most relevant for energy and environmental systems engineers, including, inter alia, air pollution, land use, water protection and climate law. Students will gain an appreciation of the legal framework's importance for their future work. They will understand the basic structure of international...

Thermo & Fluid Dynamics Simulation

Prof. Dr. Luca MANGANI

Numerical modeling and simulation with Python and CFD (Computational Fluid Dynamics). Definition/choice of model and system-boundary, meshing, boundary conditions and solver parameters, post-processing.

Strategic Mgmnt. & Product Mgmnt.

Prof. Dr. Patrick LINK

Fundamentals of strategic management, significance of corporate objectives, performance of strategic analysis, approach to strategy selection and implementation as well as strategic control, application of methods and tools within the framework of a cloud-based business plan game; fundamentals of product and innovation management, performance of product lifecycle and portfolio analysis, creation of a business model canvas, understanding of...

Introduction to Python

Dr. Oliver KASTEN

Introduction to Python as a procedural programming language. Getting to know variables, operators, control structures and functions, as well as complex data types. Overview of the most important modules and system libraries, as well as insight into processes and threads.

Autumn semester 2023/24
Fridays

Fridays mornings	**Internal code**	**Host**	**Type**	**Level**	**Credits**
Engineering Product Development Project 1	(continued)				
Energy Trading, Economics and Policies	TA.BA_ET_EC_E	EE	C	a	3
Energy Optimisation with Pinch Analysis	TA.BA_PA_E	ME	C	a	3
Building Physics	TA.BA_B_GT_E	BT	C	b	3
Data Science Project I	(continued)				
Fridays afternoons					
Context Technology 1	TA.BA_KONTT1	NS	P	b	6
Mathematics & Physics Technology 2	(continued)				
Strategic Management & Product Management	(continued)				
Thermo and Fluid Dynamics Simulation	(continued)				
Fridays evenings					
Context Technology 1	(continued)				

Module descriptions and persons in charge:

Energy Trading, Economics & Policies

Arturo EGLI

Examine structures and trends of trading renewable energies as opposed to trading „grey" energies as commodity, trading CO2 certificates and related products, innovations in this area, political guidelines, and their international ramifications.

Energy Opt. with Pinch Analysis

Prof. Dr. Beat WELLIG

Energy Optimization with Pinch Analysis: Refresher energy and process technology, fundamentals of Pinch Analysis and application of the engineering tool PinCH, representation of processes in composite curves, investment and operating costs, energy and cost targets, supertargeting, design of heat exchanger networks, optimization of utility systems, integration of heat pumps, combined heat and power systems, etc., introduction to batch and multiple base case process...

Building Physics

Prof. Dr. Heinrich MANZ

Environmental, building and room acoustics, laboratory acoustics, outdoor climate, thermal comfort, steady-state and transient heat transfer, transparent building components, air exchange, transient behaviour of a room, energy and sustainability.

Context Technology 1

Dr. Piero Angelo MARANGI

Handling of an interdisciplinary project in a team where various specializations are represented; communication of specialist skills and communication skills for creating scientific work and making a scientific presentation; promotion of project-oriented and systematic thinking, plus interdisciplinary cooperation.

Both semester Anytime

By indidividual agreement	Internal code	Host	Type	Level	Credits
Industrial Project Energy and Environmental Systems Engineering	TA.BA_PAIND_EESE	EE	P	a	6
Industrial Project Medical Engineering	TA.BA_PAIND_MT	MT	P	a	6
Electrical Engineering Industrial Project 1	TA.BA_PAIND+E1	ET	P	a	6
Mechanical Engineering Industrial Project 1	TA.BA_PAIND+M1	ME	P	a	6
Engineering Project for Industrial Engineers	TA.BA_PAIND+WI	BE	P	b	6

Module descriptions and persons in charge:

Industrial Project EESE

Prof. Dr. Shaun WEST

Independent execution of an individual project within a company. Application and deepening of problem solving, project management and professional competencies under consideration of the systemic context. Creation of convincing scientific documentation and presentation of the results.

Industrial Project Medical Eng.

Dr. Piero Angelo MARANGI

Independent execution of individual project work in a company or institution. Application and development of the problem-solving skills, project management skills and subject-specific skills and knowledge acquired during the degree program taking systemic relationships into account. Creation of a convincing scientific text and presentation of the results.

Electrical Eng. Industrial Project 1

Prof. Dr. Urs RÖTHLISBERGER

Practical project or study work in cooperation with an industrial partner or a competence center at the Lucerne University of Applied Sciences and Arts.

Mechanical Eng. Industrial Project 1

Joshua LANTER

The entire product development and/ or product optimization process is carried out as project work relating to a specific case. This is usually made in cooperation with an industrial partner. The project work is based on the direction of further specialization.

Eng. Project for Industrial Engineers

Günter ZEPF

Independent execution of an individual project work within a company. Application and deepening of problem solving, project management and professional competencies under consideration of the systemic context. Creation of a convincing scientific documentation and presentation of the results.

Intensive Weeks

Just before spring semester	**Internal code**		**Type**	**Level**	**Credits**
Design, Build and Commissioning PV-Systems in Ethopia	TA.BA_PV_HELP	NS	B	b	3
Electrical Engwineering with Lab Works	TA.BA_LAB_EE	BT	B	i	3
Recycling & Impact on Sustainability	TA.BA_RECY	NS	B	b	3
Windpower and Ecotechnology	TA.BA_WIND_ECO	EE	B	b	3
German A1			B	b	3
Just before autumn semester					
Asia	TA.BA_AS_ISA	NS	B	i	3
Ecology	TA.BA_OEK	NS	B	b	3
International Summer School	TA.BA_SUSCHOOL	NS	B	i	3
Leadership	TA.BA_LEAD	BE	B	i	3
Technology and Society	TA.BA_ME+TE	NS	B	i	3
German A1	W.SZ_DEUFF_A1	LC	B	b	3
To be decided					
Energy Data Analytics & Forecasting	TA.BA_EDAF	ET	B	a	3

Module descriptions and persons responsible

Design, Build & Com. PV in Ethopia

Roger BUSER

Many Health Centers in Ethiopia are far from grid connections. Childbirth mortality at night and cooling of vaccines is a big challenge. A 5 kW decentral Energy System, consisting of photovoltaic panels, batteries, and controls shall help. Participants team-up with local students from AMU (Arba Minch University) and learn together the sizing of the components at AST (Advanced Solar Training Center, carried out by professionals from Sahay Solar and HSLU)...

Electrical Engineering with Lab Works

Prof. Volker WOUTERS

Focus on short-circuit protection in buildings, selectivity, short-circuit resistance, thermal load capacity. Laboratory tests incl. theory.

Recycling & Impact on Sustainability

Dr. Timothy GRANATA

The topic of the course is the demand for resources and energy through recycled products worldwide. Students are also introduced to new areas such as the world of sustainable biomaterials. Questions are dealt with such as: How sustainable are the technologies and processes used in recycling? Can renewable energy and new business models make recycling more sustainable? How does recycling affect local and global carbon footprints? Case studies will be used to develop ...

Windpower and Ecotechnology

Prof. Dr. Class WAGNER

Basics of wind power technology, from determining the potential of wind power to its use with different types of turbines and systems, including the selection of materials and components, to estimating the electrical energy produced. Based on actual installations, a stakeholder analysis and environmental analyses are carried out to estimate the impact of emissions on people and ecosystems.

German A1

Dr. Isanna MENDE

The offer is aimed at non-German speaking students - beginners. The learning progress in this module is considerable. The offer is therefore tailored to motivated students.

Asia

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Asian countries, especially India and China, continue to be growth markets - and important partners for the Swiss economy. The local culture and etiquette in these countries are very different from the Western world. Introduction to the cultures and behaviour in China, India, Japan and Korea.

Ecology

Prof. Dr. Class WAGNER

Teaching the interrelationships and life cycles in ecosystems, effects of climate gases on the environment and the atmosphere, life cycle assessments (e.g. in relation to tourism) and environmental policy and economics.

International Summer School

Günter ZEPF

Students from international partner universities gain insight into various aspects of international management. Experts from international companies as well as lecturers from various universities present cases from practice as a basis for group work. In addition, visits to some international companies based in Switzerland take place.

Leadership

Prof. Dr. Michael KELLERHALS

Students learn leadership as a concept as well as its different aspects and success factors by looking at themselves, their teams and their organisations. The module is based on fundamental theoretical concepts. To facilitate their implementation in practice, it includes as an important element exercises with tools that make leaders successful. One of the aims of this module is to prepare students for their future role as leaders, project managers or product managers.

Technolgy and Socienty

Dr. Peter KIRCHSCHLÄGER

Explain ethical and legal issues surrounding the tension between „technology and society"; impart knowledge about this reciprocal relationship; understand the idea, origin, meaning and legitimation of human rights as a frame of reference; know about human rights challenges and derive options for contributing to the promotion of human rights.

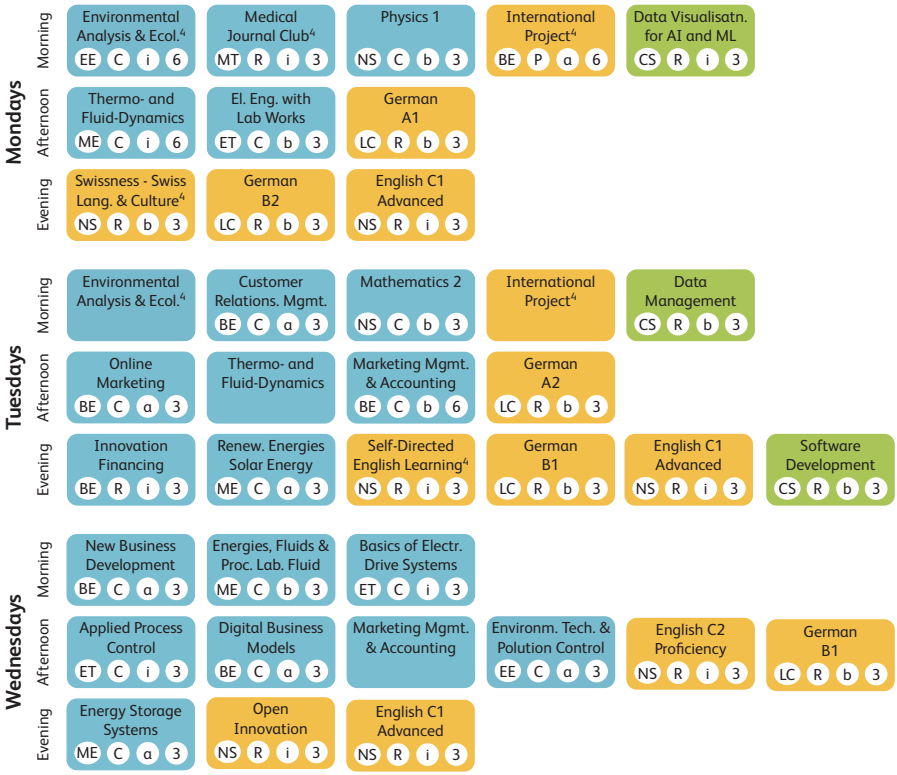
Energy Sata Analytics & Forecasting

Prof.Dr. Antonious PAPAEMMANOUIL

In this intensive week, we consider how machine learning can be used to help solve the energy forecasting problem. the participants will apply those algorithms to specific use cases regarding photovoltaics, e-mobility, storage or self-consumption optimization in order to predict load and/or production. Real-world data will be used, and practical experience will be provided by the experienced lecturers that facilitate the course. Through your project you will have practical ...

Spring semester 2024
Overview

Start of contact studies:	Monday, 19 February 2024
End of contact studies:	Saturday, 1 June 2024
Easter break:	Thursday, 28 March - Wednesday, 3 April 2024
Exams:	Monday, 16 June - Saturday, 6 July 2023
Summer break:	Monday, 15 July - Sunday, 1 September 2024
Intensive weeks:	Monday, 2 September - Saturday, 14 September 2024, and Monday, 5 February - Saturday, 17 February 2024



Eligibility
- Disciplinary module for all Engineering students
- Interdisciplinary or Language module for all students
- Module from School of Computer Science

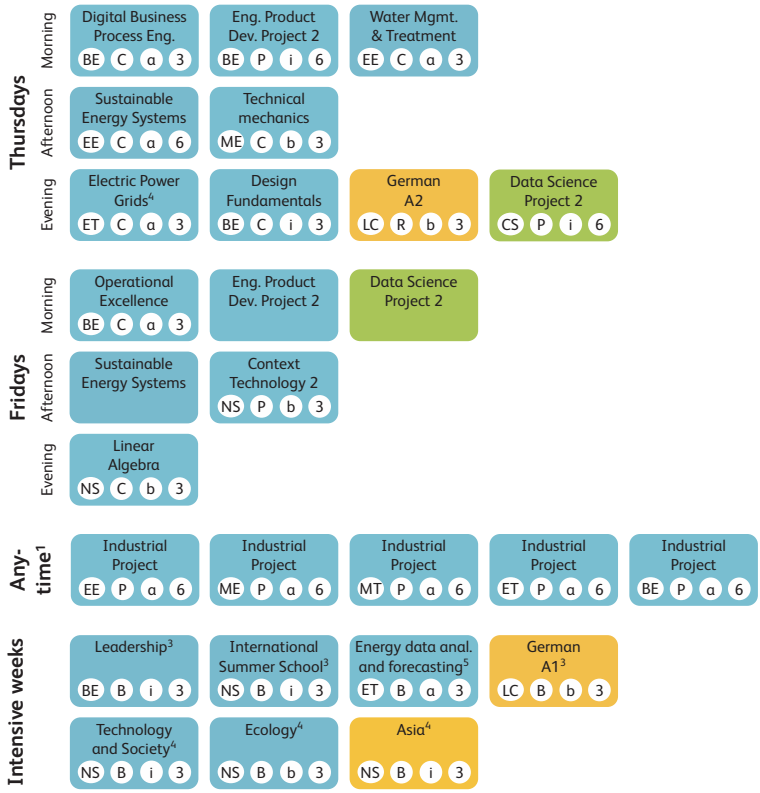
Host study programme
- BE Business Engineering I Innovation
- BT Building Technology I Energy
- EE Energy and Environmental Systems Engineering
- ET Electrical Engineering and Information Technology
- ME Mechanical Engineering
- MT Medical Engineering
- NS Natural Sciences and Humanities
- CS Departement of Computer Science
- LC Language Center

Module type
- B Block (Intensive weeks)
- C Core (Mandatory in host study programme)
- P Project
- R Related (Elective in host study programme)

Module level
- b basic (First year)
- i intermediate (Second year, some prerequisites)
- a advanced (Final year, prerequisites)

Module credits (One semester = 30 ECTS)
- 3 Lessons once a week or one intensive week
- 6 Lessons twice a week
- 12 Lessons up to four times a week

Superscripted numbers
- 1 By individual agreement
- 2 Two weeks before start of spring semester
- 3 Week before start of spring semester
- 4 COIL may apply



Spring semester 2024
Mondays

Mondays mornings	**Internal code**	**Host**	**Type**	**Level**	**Credits**
Environmental Analysis & Ecology	TA.BA_EE_ECO	EE	C	i	6
International Project	TA.BA_INTPRO	BE	P	a	6
Physics 1	TA.BA_PHYSIK1	NS	C	b	3
Medical Journal Club	TA.BA_JOURNAL	MT	R	i	3
Data Visualisation for AI and ML	I.BA_DVIZ	CS	R	i	3
Mondays afternoons					
Electrical Engineering with Lab Works	TA.BA_ET+L	ET	C	b	3
Thermo- and Fluid-Dynamics	TA.BA_THFL_E	ME	C	i	6
German A1	W.SZ_DEUFF_A1	LC	R	b	3
Mondays evenings					
German B2	W.SZ_DEUFF_B2	LC	R	b	3
Swissness - Swiss Language & Culture	TA.BA_SWISS_ISA	NS	R	b	3

Module descriptions and persons in charge:

Environmental Analysis & Ecology

Prof. Dr. Claas WAGNER

Introduction to fundamental concepts of environmental engineering and ecology, including sustainability, ecosystems, biodiversity and climate system; environmental impact assessment; implications of CO2 emissions and other pollutants on natural systems and human mankind; application of analytical and economic tools for evaluating environmental impacts and causes of environmental problems.

International Project

Prof. Dr. Christine GRIMM

Hands-on introduction to the Design Thinking method. Execution of a design project within a team, solving a real life challenge provided by an industry partner. Application and deepening of problem solving, project management and professional competencies. Creation of convincing scientific documentation and presentation of the results.

Physics 1

Sigrun KÖSTER

Teaching the basics of mechanics. Dynamics of the point of mass based on Newton's laws, work, energy, momentum and their conservation laws. Statics and motion of fluids: Gravity pressure, buoyancy, continuity equation, Bernoulli equation, flow resistance.

Medical Journal Club

Prof. Dr. Fabial ILLE

Critical reading, analysis and discussion of scientific publications in the field of biology/medicine. Introduction to scientific language.

Data Visualisation for AI and ML

Dr. Teresa Maria KUBACKA

The students get to know concepts and software solutions for data visualisations, can apply them sensibly and implement them in an interactive prototype. The entire process from data acquisition, storage and processing to various forms of interactive visualisation is methodically demonstrated, practically applied and critically reflected.

Electrical Engineering with Lab Works

Dr. Hans KURMANN

Introduction to everyday phenomena in electrical engineering. Use of practical steps and associated laboratory work in order to clearly introduce the basic aspects and principles of electrical engineering.

Thermo- and Fluid-Dynamics

Prof. Dr. Ulf Christian MÜLLER

In-depth handling of conservation factors in fluid dynamics and thermodynamics, handling compressibility and changes in state, importance of friction (dissipation), boundary layers and effects in practical applications, irreversibilities and the second law of thermodynamics, in-depth introduction to heat transfer, dimensional analysis, similarities and key figures, clockwise and counter-clockwise cycles.

German A1

Dr. Isanna MENDE

The offer is aimed at non-German speaking students - beginners. The learning progress in this module is considerable. The offer is therefore tailored to motivated students.

German B2

Barbara Lima RAMPOLLA

Students who successfully complete the module understand complex texts on concrete and abstract topics. They effortlessly follow contributions on radio and television. They communicate fluently and in a structured way so that a normal conversation with native speakers is easily possible without major effort on either side. You express yourself clearly and in detail on general topics and explain your point of view on issues that interest you. You show a fairly good ...

Swissness -Swiss Langaue & Culture

Dr. Nina ZIMNIK

Communication of skills for understanding Swiss politics, economy, society, language and culture; support of integration and student abilities; development of intercultural tolerance; application and further development of oral communication methods.

Spring semester 2024
Tuesdays

Tuesdays mornings	**Internal code**	**Host**	**Type**	**Level**	**Credits**
Customer Relationship Management	TA.BA_CRM	BE	C	a	3
Data Management	I.BA_DAMGT	CS	CR	b	3
Environmental Analysis & Ecology	(continued)				
International Project	(continued)				
Mathematics 2	TA.BA_MATH2	NS	C	b	3
Tuesdays afternoons					
German A2	W.SZ_DEUFF_A2	LC	R	b	3
Online Marketing	TA.BA_ONMA	BE	C	a	3
Marketing Management & Accounting	TA.BA_MM+RW	BE	C	b	6
Thermo- and Fluid-Dynamics	(continued)				
Tuesdays evenings					
Innovation Financing	TA.BA_INNO_FN	BE	R	i	3
Renewable Energies - Solar Energy	TA.BA_EE+SOL_E	ME	C	a	3
Self-Directed English Language Learn.	TA.BA_SELL	NS	R	i	3
German B1	W.SZ_DEUFF_B1	LC	R	b	3
English C1 Advanced	TA.BA_CAE_SZ	NS	R	i	3
Software Development	I.BA_BUSOD	CS	R	b	3

Module descriptions and persons in charge:

Customer Relationship Management

Angelos APOSTOLIDIS

The module focusses on the importance of a customer centric view and how to build on this mindest a customer centric strategy and relationship. Therefore the module will discuss the use of modern CRM based concepts by analyzing different case studies and practical examples. Based on that it will be reviewed how to reconcile a customer centric view with your business strategy. The course will also discuss how to identify your customers and their needs...

Data Management

Prof. Dr. Alexander DENZLER

Data is the new oil - it is the fuel of our modern, technology-based society. Against this background, it is particularly important to understand what data actually is, how it can be converted into information and what types of data exist. In a first step, the modelling, structure and querying of relational databases is taught. The second step then deals with so-called NoSQL databases. The focus here is on graph databases.

Mathematics 2

Dr. Jung Kyu CANCI

Complex numbers: normal and polar forms, Euler's formula, roots of complex numbers. First order differential equations: basic definitions, Euler's method, method of separation of variables and method of variation of the constant. Second order differential equation: Different types of differential equations in particular linear equations, homogeneous and inhomogeneous. Several applications to real word problems, in particular to harmonic oscillations.

German A2

Dr. Isanna MENDE

The module is aimed at non-German-speaking students with German language skills of at least level A1. Students who successfully complete the module understand and use sentences and frequently used expressions. Students can communicate in simple situations involving a direct exchange of information. One can describe one's own origin, education and immediate surroundings in context.

Online Marketing

Angelos APOSTOLIDIS

The module discusses the relevance and use of Online Marketing as part of companies marketing actions and concepts. Therefore the module will allow the students to know the current and common instruments of Online Marketing, how to integrate them into an overall marketing strategy and how to control their actions and the success of them. All this by considering the risks and possibilities. For that the course will discuss different case studies and practical examples...

Marketing Mgmt. & Accounting

Prof. Dr. Michael BLANKENAGEL

Understanding the fundamentals of marketing, knowing, and applying the methods of marketing research, conception, implementation and controlling. Using financial information for decision making, applying basic financial and management accounting methods, basic understanding, and ability to analyse financial reporting, applied in a management simulation

Innovation Financing

Dr. Matthias Daniel AEPLI

Introduction to corporate finance, approaches to innovation financing, determining risk and return of investments, understanding capital structure decisions, performing project and company valuation.

Renewable Energies - Solar Energy

Prof. Dr. Thomas NUSSBAUMER

In this module, the basic physical requirements and technology required to use solar energy are examined. Aside from solar heat in buildings, photovoltaics and concentrated solar thermal energy for processes and energy generation are dealt with. In addition, design principles for the planning phase, the use of commercial design software and costs and economic feasibility are part of this module.

Self Directed English Lang. Learning

Franz HAGMANN

Focus on fostering English language skills from level B2/FCE onwards; communication of language learning techniques based on specialist texts, with the goal of continually and independently improving individual language skills.

German B1

Dr. Isanna MENDE

The module is aimed at non-German-speaking students with German language skills of at least level A2. Students who successfully complete the module can understand non-fiction texts on concrete and abstract topics, write coherent texts on topics of general interest and from their own area of interest, hold a conversation on familiar topics relatively fluently and without preparation.

English C1 Advanced

Tina BRØDSGAARD

Expanding vocabulary and grammar skills and improving listening and reading comprehension to English C1 Advanced level. In addition, oral and written expression is refined. In addition, strategies for mastering the standardized English C1 Advanced task types are acquired.

Software Development

Aakanksha TIWARI

The module covers the most important components of business software. The students deepen their knowledge of code quality and refactoring. In a next step, students develop graphical user interfaces. File handling and network concepts are central components of business applications and are therefore also taught. The implementation of client-server architectures rounds off this module.

Spring semester 2024
Wednesdays

Wednesdays mornings	**Internal code**	**Host**	**Type**	**Level**	**Credits**
Basics of Electrical Drive Systems	TA.BA_ET+A_E	ET	C	i	3
New Business Development	TA.BA_NBD_E	BE	C	a	3
Energies, Fluids & Processes Lab Fluid	TA.BA_EFPLAB1_E	ME	C	b	3
Wednesdays afternoons					
Applied Process Control	TA.BA_APC	ET	C	i	3
Environmt. Techn. & Pollution Control	TA.BA_AIRCON_E	EE	C	a	3
Marketing Management & Accounting	(continued)				
Digital Business Models	TA.BA_DBM_E	BE	C	a	3
English C2 Proficiency	TA.BA_PROF_SZ	NS	R	i	3
German B1	W.SZ_DEUFF_B1	LC	R	b	3
Wednesdays evenings					
Open Innovation	TA.BA_OPEN_ISA	NS	R	i	3
English C1 Advanced	TA.BA_CAE_SZ	NS	R	i	3
Energy Storage Systems	TA.BA_STORAGE_E	ME	C	a	3

Basics of Elektrical Drive Systems

Prof. Dr. Jonas MÜHLETHALER

Covering the functional principal, the equivalent circuit and the design fundamentals of the most common electrical machines and power electronic circuits like dc-converters, rectifiers, inverters, and converters. Merging the components to efficient drive systems. Discussion of the advantage and disadvantages of the different systems.

New Business Development

Prof. Dr. Michael KELLERHALS

The module teaches how to design a new business development strategy and how to set up a related project. The presented framework is embedded in strategic management, business model innovation, corporate finance, and project management. The module strongly relies on case studies. The module covers intrapreneurship, ambidextrous organization designs, venturing, mergers, acquisitions, joint ventures, negotiations tactics, legal aspects, integration management...

Energies, Fluids & Processes Lab Fluid

Prof. Dr. Ulf Christian MÜLLER

Introduction to the fundamentals of energy technology, balancing of systems (mass, material and energy), state variables and fluid properties (gases and liquids), forms of energy and energy transformations, basics of heat transfer, energy conservation for fluid mechanics (Bernoulli equation) and thermodynamics (1st LT) for closed and open systems). Practical relevance through lab tests with heat exchangers, pumps, compressors.

Applied Process Control

Dr. Armin TAGHIPOUR

The concepts of systems and signals will be explained and characterized by means of Laplace transformation. Students will become familiar with feedback loops and will learn to design controllers that guarantee stability and performance. Laboratories will help to consolidate the acquired knowledge.

Environmt. Techn. & Pollution Control

Dr. Martin STREICHER-PORTE

Understanding the formation and release of emissions, extend and corresponding effects of emissions, transmissions and immersions of individual pollutants, knowing and applying air pollution control technologies, classification of gas treatment processes and defining their area of application.

Digital Business Models

Prof. Dr. Michael KELLERHALS

The module explains what is business model innovation and what is it used for. It reveals how business model innovation is embedded in strategic management. The module introduces the most important business model frameworks and provides hands-on guideline to select, develop, and apply them. In the course of studies an overview of the most important digital technologies will be provided as an enabler for disruptive business model innovations. The students will ...

English C2 Proficiency

Anna CHRISTEN

Expanding vocabulary and grammar skills and improving listening and reading comprehension at English C2 Proficiency level. Refinement of oral and written expression, in addition to acquiring strategies for mastering the standardized Cambridge English C2 Proficiency task types.

Open Innovation

Julie HARBOE

Learning the basic concepts of systematic ideation and the purposive use of technology. Practicing the methods of collaborative creativity. Discussing complex questions of partnership and intellectual property. Participating in a true innovation movement.

Energy Storage Systems

Prof. Dr. Jörg WORLITSCHEK

Principles of energy supply, with a focus on the renewable energies. Importance, application and overview of energy storage. Planning and use of modern energy storage. Storage of thermal energy: Fundamentals of thermodynamics, exergy analysis and interpretation, modeling and application, thermal energy networks. Storage of electrical energy: fundamentals of electrical storage, analysis and interpretation. Modeling and applications and electrical...

Spring semester 2024
Thursdays

Thursdays mornings	**Internal code**	**Host**	**Type**	**Level**	**Credits**
Digital Business Process Engineering	TA.BA_DBPE_E	BE	C	a	3
Engineering Product Development Project 2	TA.BA_PDP2	BE	P	i	6
Water Management & Treatment	TA.BA_WATER_E	EE	C	a	3
Thursdays afternoons					
Sustainable Energy Systems	TA.BA_SES_E	EE	C	a	6
Technical Mechanics	TA.BA_TECHMECH	ME	C	b	3
Thursdays evenings					
Design Fundamentals	TA.BA_INDES1_E	BE	C	b	3
Electric Power Grids	TA.BA_EPG_E	ET	C	a	3
Data Science Project 2	I.BA_DSPRO2	CS	P	i	6
German A2	W.SZ_DEUFF_A2	LC	B	b	3

Module descriptions and persons in charge:

Digital Business Process Engineering

Prof. Dr. Clemente MINONNE

This module provides an introduction to the fundamentals, approaches and methods required for digital business process engineering on the basis of a cycle-based framework model (5 phases), which represents a typical management cycle. Different models, methods and techniques are applied, based on concrete practical examples. Transfer of knowledge is been facilitated and active work is necessary (group exercises, case studies).

Eng. Product Development Project 2

Prof. Dr. Simon ZÜST

Engineering project: Experiencing the development of a product in an interdisciplinary team. Integration of the solution parts to demonstrate the overall system concept. Presentation and visualization of solutions, design concepts and the final result to the public.

Water Management & Treatment

Prof. Dr. Sabine SULZER

Introduction to drinking- and wastewater systems and infrastructure, wastewater constituents and water quality assessment, municipal and industrial wastewater treatment, techniques of wastewater treatment, rainwater and drinking water treatment processes, knowledge of planning and design of drinking- and wastewater engineering processes, water / grey water re-use. In addition, laboratory exercises and excursions are carried out.

Sustainable Energy Systems

Dr. Anastasia STAMATIOU

Addressing the question of "When do solutions deserve to be called sustainable?" Investigating methods and innovations that address the conditions of new systems, including the provisioning of energy, its processing, distribution, application and conversion as well as environmental footprint and responsibility for everyone on our planet; focus on questions of economic feasibility.

Technical Mechanics

Priska HERZOG

Introduction to design methods and materials selection in design process. Overview of machine elements and their applications. Introduction to engineering mechanics: plain statics and strength of materials.

Electric Power Grids

Prof. Dr. Jonas MÜHLETHALER

The following topics are covered: Transformation of primary energy into electrical energy. Fundamentals of the main grid components of a power system (generators, transformers, substation and transmission lines/cables). Grid analysis techniques such as load-flow and short-circuit calculation. Methods of power system control. Analysis of blackouts and concepts of protection systems.

Design Fundamentals

Hannes FELBER

This module gives an overview of the discipline and processes of industrial design. Parts of the design process such as perception, ergonomics and creativity will be experienced through practical exercises. The ability to innovate is core of this module and will be practiced intensively.

Data Science Project 2

Dr. Umberto MICHELUCCI

In this advanced course, students will embark on creating sophisticated data science and machine learning solutions. From the outset, they select a project that will be honed into a full-fledged application. The curriculum is an intricate tapestry of expert-led lectures and mentorship sessions, crafted to impart skills that meet the demands of the industry. Beyond the elementary principles of data science, the syllabus delves into intricate topics such as neural network foundations...

German A2

Dr. Isanna MENDE

The module is aimed at non-German-speaking students with German language skills of at least level A1. Students who successfully complete the module understand and use sentences and frequently used expressions. Students can communicate in simple situations involving a direct exchange of information. One can describe one's own origin, education and immediate surroundings in context.

Spring semester 2024
Fridays

Fridays mornings	**Internal code**	**Host**	**Type**	**Level**	**Credits**
Operational Excellence	TA.BA_OAE_E	BE	C	a	3
Data Science Project 2	(continued)				
Engineering Product Development Project 2	(continued)				
Fridays afternoons					
Sustainable Energy Systems	(continued)				
Context Technology 2	TA.BA_KONTT2	NS	P	b	3
Fridays evenings					
Linear Algebra	TA.BA_LINALG_E	NS	C	b	3

Module descriptions and persons in charge:

Operational Excellence

Fabio MERCANDETTI

Deepened analysis of the Supply Chain of industrial companies, in search of Excellence, based on the principles and tools of the Toyota Production System and its evolution into Lean Management. These concepts and tools will be explained and applied in several case studies and in a final production simulation game, so that participants will „touch with their hands" the significant difference between traditional and „lean" approaches in Operations.

Context Technology 2

Petruscka MEYER

Promotion of written and oral language skills in relation to studies and professional practice; teaching and application of professionally relevant text types, speech and presentation methods as well as addressee-oriented writing; target group-oriented implementation of verbal, non-verbal and para-verbal means in various oral communication situations.

Linear Algebra

Dr. Peter SCHEIBLECHNER

Basics of linear algebra, including matrix algebra and its applications, especially with regard to Euclidean space and linear transformations, as well as eigenvalue and singular value decomposition; solution of mathematical problems using algebraic and numerical processes and their graphical representation, particularly when using numerical software such as MATLAB or Python.

Correct as of 10 January 2024, subject to changes.

Contact

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Disclaimer
The timetables can be changed for organisational reasons. The final selection is only fixed shortly before the start of the semester. This timetable for the academic year 2023/24 also serves as an orientation for the academic year 2024/25, as the timetables change only slightly between the academic years.