

HOCHSCHULE ANSBACH

Modulhandbuch

Applied Sustainable Engineering (SPO SS 26)

Fakultät Technik

Stand: 2026-11-05

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1 Introduction to the course of studies

Applied Sustainable Engineering			
Short form:	ASE	**SPO no.:**	HSAN-20261
Program Director:	Prof. Dr. Christian Wilisch		
Study Counseling:	Prof. Dr. Christian Wilisch		
ECTS:	240		
Normal period:	8 semesters		
Prerequisite for participation:	German university eligibility, good working knowledge of Englisch		
Usability:	Bachelor Applied Sustainable Engineering		

Learning outcomes:

The bachelor's degree programme “Applied Sustainable Engineering Technologies” provides a fundamental engineering education that prepares students for professional employment and the labour market. The programme focuses on the sustainable design, conceptual development and optimisation of technical products and processes, as well as their integration into larger systems.

The degree programme provides students with the opportunity to acquire the qualifications required for admission to a master's degree programme.

The structure and content of the curriculum reflect the diversity and rapid pace of technological and economic change, as well as the continuous advancement of methods and tools in the field of Sustainable Engineering.

The aim of the degree programme is to qualify engineers who possess the specialist knowledge and practical skills required for the systematic design, conceptual development and optimisation of technical products and processes, and who are able to apply these skills in an interdisciplinary and collaborative team environment within their respective fields, with particular emphasis on sustainability.

The German language skills acquired by the students enable them, upon graduation, to play an active role in shaping societal processes in a critical and reflective manner, with a strong sense of responsibility and commitment to democratic values.

Content:

The course is designed for 8 semesters to give the students a chance to acquire German language skills in order to attend lecture in German in the programme NIW ('Nachhaltige Ingenieurwissenschaften') after the third term. The programmes ASE and NIW are identical after the third term (ASE) or secod term (NIW), respectively.

During the first three terms the students acquire a good working knowledge of the German language and are taught the fundamentals of engineering sciences (mathematics, physics, chemistry, electronics, computer science).

For the structure of the programme after the third term, please refer to the relevant sections of the handbook for NIW.

Graduation / Academic degree:

Bachelor of Engineering (B.Eng.)

2 Description of Modules

2.1 Grundlagen-Pflichtmodule

Mathematics 1

Module abbreviation:	ASE-Mathematik 1	**Reg.no.:**	
Curriculum:	**Programme**	**Module type**	**Semester**
	Bachelor Applied Sustainable Engineering (SPO SS 26)	basics compulsory module	1

Responsible for module:	Prasol, Lukas
Lecturers:	Prasol, Lukas
Language of instruction:	English
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 45 h Self-study: 105 h Total: 150 h
Subjects of the module:	Mathematics 1
Lecture types:	SU/Ü - Seminar-based teaching/exercise
Examinations:	written exam, 90 minutes (electronic exam to § 2 Abs. 1 BayFEV) Prerequisite for the granting of credit points is the passing of the respective module examination in accordance with the SPO resp. study plan.

Prerequisites according examination regulation:

According to the SPO or curriculum

Recommended prerequisites:

None

Objectives:

Subject-specific and methodological competence:

Students acquire the mathematical terms, concepts, and principles essential for engineering studies. In doing so, they gain an understanding of the prerequisites, mechanisms, and applicability of these mathematical methods.

Practical competence:

Students master the necessary mathematical calculations and are able to apply their knowledge practically to fields within the engineering sciences, as well as draw conclusions from the results.

Social competence:

Students organize themselves into study groups that bring together students with strong mathematical skills and those who are less proficient, enabling them to work through the lecture material collaboratively. This allows both groups to benefit from one another, resulting in optimal overall learning outcomes.

Content:

- Komplexe Zahlen
- Lineare Algebra / Vektoralgebra
- Funktionen
- Differentialrechnung

- Integralrechnung

Literature:

- Mathematik für Ingenieure und Naturwissenschaftler, Papula, Bände 1-6, 2016 (Deutsch)
- Taschenbuch der Mathematik, Bronstein, 2020 (Deutsch)
- Mathematische Formelsammlung, Papula, 2017 (Deutsch)
- Mathematics 1 - Volume 1, Westermann, 2024 (Englisch)
- Mathematics for Physicists and Engineers, Weltner, John, Weber, Schuster, Grosjean, 2023 (Englisch)

Physics 1

Module abbreviation:	ASE-Physik 1	**Reg.no.:**	
Curriculum:	**Programme**	**Module type**	**Semester**
	Bachelor Applied Sustainable Engineering (SPO SS 26)	basics compulsory module	1

Responsible for module:	Rychkov, Dmitry
Lecturers:	Rychkov, Dmitry
Language of instruction:	English
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 60 h Self-study: 90 h Total: 150 h
Subjects of the module:	Physics 1
Lecture types:	SU/Ü - Seminar-based teaching/exercise
Examinations:	wirtten exam, 90 minutes (electronic remote exam § 2 Abs. 1 BayFEV) Prerequisite for the granting of credit points is the passing of the respective module examination in accordance with the SPO resp. study plan.

Prerequisites according examination regulation:

According to the SPO or curriculum

Recommended prerequisites:

None

Objectives:

Students understand the fundamental concepts, models and laws of classical mechanics and can use them to analyse engineering and scientific problems quantitatively. They use physical quantities, SI units, dimensions and significant figures correctly and assess results for plausibility and order of magnitude. They describe motion in one and several dimensions, apply Newton's laws and construct appropriate free-body diagrams. They apply the concepts of work, energy, power, linear momentum and the corresponding conservation laws to solve problems involving particles and systems of particles. They describe rotational motion using angular quantities and determine rotational kinetic energy, moments of inertia, torque and angular momentum. They apply conservation of angular momentum and recognise the relationship between translational and rotational dynamics. Students can abstract real situations, select suitable idealised models, formulate the governing equations and interpret quantitative results. They are able to communicate solution strategies clearly and to prepare independently for subsequent experimental work in physics.

Content:

Physical quantities and units: SI system, dimensions, significant figures and orders of magnitude. Kinematics: one-dimensional motion; position, displacement, velocity and acceleration; uniformly accelerated motion; integration of equations of motion; motion in space; projectile motion; circular motion. Dynamics: Newton's laws; inertia, force and mass; weight; fundamental forces; Newton's third law; free-body diagrams; applications of Newton's laws; friction; inertial and fictitious forces. Work and energy: work; kinetic energy; work-energy theorem; potential energy; conservative forces; power; conservation of mechanical energy; introduction to mass-energy equivalence and quantisation of energy. Systems of particles and linear momentum: centre of mass; linear momentum; conservation of momentum; impulse; average force; one-dimensional

collisions; perfectly inelastic and elastic collisions; ballistic pendulum; collisions in three dimensions. Rotational motion: angular position, angular velocity and angular acceleration; relation between linear and angular quantities; tangential and centripetal acceleration; rotational kinetic energy; moment of inertia and calculation of moments of inertia for simple bodies; torque; rotational dynamics; power in rotational motion; vector nature of torque and angular momentum; conservation of angular momentum; introductory aspects of angular-momentum quantisation.

Literature:

- P. A. Tipler & G. Mosca: Physik für Wissenschaftler und Ingenieure.
- Hering, Martin, Stohrer: Physik für Ingenieure.
- Kuchling: Taschenbuch der Physik.
- Vorlesungsskript Physik 1 und begleitende Übungsunterlagen.

General and Organic Chemistry

Module abbreviation:	ASE-Allgemeine und Organische Chemie	**Reg.no.:**	
Curriculum:	**Programme**	**Module type**	**Semester**
	Bachelor Applied Sustainable Engineering (SPO SS 26)	basics compulsory module	1

Responsible for module:	Künzel, Sebastian
Lecturers:	Künzel, Sebastian
Language of instruction:	English
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 45 h Self-study: 105 h Total: 150 h
Subjects of the module:	General and Organic Chemistry
Lecture types:	SU/Ü - Seminar-based teaching/exercise
Examinations:	take-home exam, 90 minutes Prerequisite for the granting of credit points is the passing of the respective module examination in accordance with the SPO resp. study plan.

Prerequisites according examination regulation:

According to the SPO or curriculum

Recommended prerequisites:

None

Objectives:

Students will know fundamental concepts of general chemistry, that will be necessary fort he understanding of organic chemistry. They are familiar with the basic reaction mechanisms of carbon based chemistry and their stereochemical consequences. Based upon a broad selection of common reaction types for different functional groups, they will be able to understand and develop multi-step synthetic pathways.

Content:

Stoichiometric caclulations, atomic and molecular structure, acid-base theory, equilibrium, redox reactions, writing of formulas and reactions in organic chemistry, isomers, nomenclature of organic compounds, reaction mechanisms (radicalic, nucleophilic and electrophilic substitution, elimination, addition), chirality, retrosynthesis

Important properties and reactions of alkanes, alkenes, alkines, aromatic compounds, alcohols, thiols, aldehydes/ketones, carboxylic acids, ethers, esters, amines and amides. Solid phase synthesis and combinatorial chemistry.

Literature:

- Paula Bruice: Organic Chemistry, Global Edition, 9. Aufl., Pearson 2025
- Crowe, Bradshaw: Chemistry for the Biosciences: The essential concepts, 4. Aufl., Oxford University Press 2023

- Mortimer, Müller: Chemie. Das Basiswissen der Chemie, 13. Aufl., Thieme Verlag 2019
- Any book on the subject in your native language that covers the content of the lecture!

Business Administration

Module abbreviation:	ASE-Betriebswirtschaftslehre	**Reg.no.:**	
Curriculum:	**Programme**	**Module type**	**Semester**
	Bachelor Applied Sustainable Engineering (SPO SS 26)	basics compulsory module	1

Responsible for module:	Scholz, Stefanie
Lecturers:	Scholz, Stefanie
Language of instruction:	English
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 45 h Self-study: 105 h Total: 150 h
Subjects of the module:	Business Administration
Lecture types:	SU/Ü - Seminar-based teaching/exercise
Examinations:	wirtten exam, 90 minutes (electronic remote exam § 2 Abs. 1 BayFEV) Prerequisite for the granting of credit points is the passing of the respective module examination in accordance with the SPO resp. study plan.

Prerequisites according examination regulation:

According to the SPO or curriculum

Recommended prerequisites:

None

Objectives:

The module enables students to acquire fundamental knowledge of business administration and to apply it to practical and interdisciplinary contexts. Students learn to analyse business structures and processes, evaluate economic decisions, and consider the interaction between technical, ecological, and economic factors. This provides an essential foundation for further study and professional work in applied life science technologies and applied sustainable engineering.

After successful completion of the module, students are able to:

- explain the basic principles, concepts, and functions of business administration and classify them in the context of companies and organisations.
- understand and describe key business processes, including procurement, production, marketing, finance, controlling, and human resource management.
- analyse business decisions with regard to efficiency, value creation, and resource use.
- apply fundamental business methods and instruments to practical problems in technology- and sustainability-oriented settings.
- assess the economic aspects of technical and sustainable solutions and recognise their impact on company performance.
- understand the role of innovation, digitalisation, and sustainability in modern business management.

- communicate and discuss basic business issues using appropriate terminology.
- develop an interdisciplinary perspective that links technical, ecological, and economic considerations.

Content:

The module introduces the fundamentals of business administration and economic thinking in technical and sustainability-oriented contexts. It covers key areas such as the basics of business processes, procurement and production, marketing, finance and controlling, as well as organisational structures and decision-making. Special attention is given to the relationship between technical solutions, economic efficiency, and sustainability. Students learn how business methods can be applied to practical cases from applied life science technologies and applied sustainable engineering.

- Fundamentals of business administration: companies as systems, goals of firms, stakeholders, value creation.
- Legal forms of business and basics of entrepreneurship for technology- and science-based ventures.
- Core business functions: procurement and supply, production and operations, marketing, finance, accounting, controlling, human resources.
- Cost and performance concepts: fixed and variable costs, contribution margin, break-even considerations for technical and sustainable solutions.
- Basics of investment and financing decisions in engineering and life science projects (capital needs, simple profitability assessments).
- Organisation and management: simple organisational structures, management functions, leadership and teamwork in technical environments.
- Introduction to sustainability and business: economic, ecological and social dimensions, corporate social responsibility, sustainable business models.
- Case examples from applied life science technologies and applied sustainable engineering (e.g. product development, process optimisation, or resource-efficient solutions) to illustrate business decisions.

Literature:

- Adom, K.; Hinson, R. E.; Mintah, E. O.; Obuobisa-Darko, T. (2023), Business Administration: An Introduction for Managers and Business Professionals, Productivity Press.
- Hitt, M. A.; Ireland, R. D.; Hoskisson R. E. (2019), Strategic Management: Concepts and Cases: Competitiveness and Globalization: Competitiveness & Globalization, Concepts and Cases, 13th edition, Cengage Learning, Inde-pendence.
- Kumar, V.; Reinartz, W. (2018), Customer Relationship Management: Concept, Strategy, and Tools, 3rd edition, Springer, Heidelberg.
- Robbins, S.; Robbins, S. P.; Coulter, M. A. (2024), Management, 16th edition, Pearson, München.
- Wöhe, G.; Döring, U.; Brösel, G. (2023), Einführung in die Allgemeine Betriebswirtschaftslehre, 28. überarbeite-te und aktualisierte Ausgabe, Verlag Franz Vahlen, München.

Mathmatics 2

Module abbreviation:	ASE-Mathematik 2	**Reg.no.:**	
Curriculum:	**Programme**	**Module type**	**Semester**
	Bachelor Applied Sustainable Engineering (SPO SS 26)	basics compulsory module	2

Responsible for module:	Moog, Mathias
Lecturers:	Moog, Mathias
Language of instruction:	English
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 48 h Self-study: 102 h Total: 150 h
Subjects of the module:	Mathmatics 2
Lecture types:	SU/Ü - Seminar-based teaching/exercise
Examinations:	written exam, 90 minutes Prerequisite for the granting of credit points is the passing of the respective module examination in accordance with the SPO resp. study plan.

Prerequisites according examination regulation:

According to the SPO or curriculum

Recommended prerequisites:

None

Objectives:

Subject-Specific and Methodological Competence:

Students are familiar with the most important mathematical concepts and methods required in science and engineering bachelor programs

Practical Competence:

Students are able to describe and solve technical and economic problems using mathematics. Students can perform complex calculations with the aid of computers.

Social Competence:

Students are able to work on mathematical problems both in a team and independently. They can communicate mathematical formulas and instructions in natural language.

Content:

The module consists of seminar-style instruction with integrated exercises.

- Ordinary differential equations (first-order differential equations, second-order linear differential equations with constant coefficients, oscillations, Laplace transform, systems of linear differential equations)
- Series expansions of real functions (power series, Taylor series, and Fourier series)
- Differential Calculus for Functions of Several Variables (partial derivatives, total differential, applications: linearization of a function, local extrema with constraints)

- Integral Calculus for Functions of Several Variables (double and triple integrals)
- Numerical Methods (Newton's tangent method, numerical integration, numerical solution of a differential equation)
- Vector calculus (scalar and vector fields, gradient, divergence, and curl operators, Laplace and Poisson equations)

Students will learn these mathematical methods both for manual application and with the aid of a computer.

Literature:

- Weltner, Mathematics for Physicists and Engineers, Springer
- Papula, Mathematik für Ingenieure und Naturwissenschaftler Bd. 1-3, Vieweg Verlag
- Arens u.a., Mathematik, Spektrum Akademischer Verlag (optional)
- Formelsammlungen:
- Papula, Mathematische Formelsammlung für Ingenieure und Naturwissenschaftler, Vieweg Verlag
- Bronstein; Semendjajew, Taschenbuch der Mathematik, Teubner Verlag, in verschiedenen Sprachen erhältlich
- Software:
- Python mit den entsprechenden Anleitungen und Hilfen

Physics 2

Module abbreviation:	ASE-Physik 2	**Reg.no.:**	
Curriculum:	**Programme**	**Module type**	**Semester**
	Bachelor Applied Sustainable Engineering (SPO SS 26)	basics compulsory module	2

Responsible for module:	Rychkov, Dmitry
Lecturers:	Rychkov, Dmitry
Language of instruction:	English
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 60 h Self-study: 90 h Total: 150 h
Subjects of the module:	Physics 2
Lecture types:	SU/Ü - Seminar-based teaching/exercise
Examinations:	written exam, 90 minutes Prerequisite for the granting of credit points is the passing of the respective module examination in accordance with the SPO resp. study plan.

Prerequisites according examination regulation:

According to the SPO or curriculum

Recommended prerequisites:

None

Objectives:

Students understand the physical principles of fluids, oscillations, waves and thermodynamics and apply them to engineering and scientific problems. They analyse hydrostatic pressure, buoyancy and fluid flow using the relevant conservation laws. They describe harmonic, damped and forced oscillations, determine characteristic quantities and explain resonance and energy transfer. They use wave functions and the wave equation to describe wave propagation and analyse reflection, refraction, diffraction, interference, beats, standing waves and polarisation. In thermodynamics, students use temperature scales and equations of state, relate macroscopic state variables to kinetic gas theory, and calculate heat, internal energy and work. They apply the first, second and third laws of thermodynamics, analyse reversible and irreversible processes, heat engines, refrigerators, heat pumps and the Carnot cycle, and use entropy to assess thermodynamic processes. They analyse thermal expansion, real-gas behaviour and heat transfer by conduction, convection and radiation. Students can select suitable models, solve quantitative problems, interpret diagrams such as p-V diagrams, and transfer the theoretical concepts of Physics 1 and Physics 2 to the physics laboratory course planned for semester 3.

Content:

Fluids: density and specific weight; pressure; bulk modulus and compressibility; hydrostatics; Pascal's principle and hydraulic systems; communicating vessels and manometers; barometer; Archimedes' principle and buoyancy; moving fluids; continuity equation; volume flow rate; Bernoulli equation and Venturi effect. Oscillations: simple harmonic motion; harmonic oscillator; energy of the harmonic oscillator; damped oscillations; forced oscillations and resonance; phase relation, quality factor and mean power transfer. Waves: simple wave motion; wave function; propagation velocity; wave equation; periodic and harmonic waves;

wavelength, frequency and wave number; phase velocity; dispersion and dispersion relation; group velocity; waves in three dimensions; wavefronts; intensity and energy density; sound intensity and sound level; reflection and refraction; Snell's law; total internal reflection; diffraction and interference; superposition; path difference; constructive and destructive interference; beats; standing waves and resonance frequencies; polarisation. Thermodynamics: thermal equilibrium and the zeroth law; Celsius, Fahrenheit and absolute temperature; gas thermometers; ideal-gas equation of state and gas laws; kinetic gas theory; equipartition; root-mean-square molecular speed; mean free path; Maxwell-Boltzmann speed distribution. Heat and the first law: heat capacity and specific heat capacity; calorimetry; phase transitions and latent heat; Joule's experiment; internal energy of an ideal gas; volume work and p-V diagrams; molar heat capacities; equipartition and degrees of freedom; reversible adiabatic processes. Second law: heat engines, refrigerators, Carnot cycle and Carnot efficiency; heat pumps; irreversibility and entropy; entropy changes of ideal gases; entropy and availability of energy; entropy and probability. Third law of thermodynamics. Thermal properties and processes: thermal expansion; van der Waals equation and liquid-vapour isotherms; heat transfer by conduction, convection and radiation; thermal resistance; Stefan-Boltzmann law and Wien's displacement law.

Literature:

- P. A. Tipler & G. Mosca: Physik für Wissenschaftler und Ingenieure.
- Hering, Martin, Stohrer: Physik für Ingenieure.
- Kuchling: Taschenbuch der Physik.
- Vorlesungsskript Physik 2 und begleitende Übungsunterlagen.

Inorganic Chemistry

Module abbreviation:	ASE-Anorganische Chemie	**Reg.no.:**	
Curriculum:	**Programme**	**Module type**	**Semester**
	Bachelor Applied Sustainable Engineering (SPO SS 26)	basics com-pulsory module	2

Responsible for module:	Künzel, Sebastian
Lecturers:	Künzel, Sebastian
Language of instruction:	English
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 45 h Self-study: 105 h Total: 150 h
Subjects of the module:	Inorganic Chemistry
Lecture types:	SU/Ü - Seminar-based teaching/exercise
Examinations:	written exam, 90 minutes Prerequisite for the granting of credit points is the passing of the respective module examination in accordance with the SPO resp. study plan.

Prerequisites according examination regulation:

According to the SPO or curriculum

Recommended prerequisites:

None

Objectives:

Students will have broad knowledge in General and Inorganic Chemistry as well as in Physical Chemistry, with an emphasis on Thermochemistry and Thermodynamics. They are familiar with important properties, reactions and compounds of the elements. They know important industrial chemical processes.

Content:

Repetition and broadening of atomic and molecular structure, acid-base- and redox reactions, Physical Chemistry, Chemistry of the Elements

Literature:

- Housecroft, Inorganic Chemistry, 5th Edition, Pearson 2018
- Atkins, Atkin´s Physical Chemistry, 11th Edition, Oxford University Press 2018
- Binnewies, Allgemeine und Anorganische Chemie, 3. Auflage, Springer Spektrum 2016
- Atkins, Kurzlehrbuch Physikalische Chemie: für natur- und ingenieurwissenschaftliche Studiengänge, 5. Auflage, Wiley VCH 2019

Informatics

Module abbreviation:	ASE-Informatik	**Reg.no.:**	
Curriculum:	**Programme**	**Module type**	**Semester**
	Bachelor Applied Sustainable Engineering (SPO SS 26)	basics compulsory module	2

Responsible for module:	Moog, Mathias
Lecturers:	Esmaili, Babak
Language of instruction:	English
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 45 h Self-study: 105 h Total: 150 h
Subjects of the module:	Informatics
Lecture types:	SU/Ü - Seminar-based teaching/exercise
Examinations:	written exam, 90 minutes Prerequisite for the granting of credit points is the passing of the respective module examination in accordance with the SPO resp. study plan.

Prerequisites according examination regulation:

According to the SPO or curriculum

Recommended prerequisites:

German for Beginners, Mathematics 1

Objectives:

Subject-specific and methodological competence:

Students master the fundamentals of an object-oriented programming language and are familiar with the capabilities of Python. They understand the roles of variables, functions, objects, and classes, and are proficient in using key control structures. They are familiar with the basics of performing file operations and using complex data types. Thanks to the fundamental data science techniques they have acquired, they are able to analyze and visualize data series.

Action competence:

Students can evaluate software development aimed at solving business or engineering problems and can independently adapt, or program solutions for smaller-scale tasks. Students are better equipped to assess software tools in terms of performance, development capabilities, and extensibility. Learning additional programming languages such as VBA, C, or Java is significantly facilitated.

Social competence:

Students learn to collaborate constructively while working on exercises in small groups. In doing so, they become familiar with teamwork, knowledge sharing, and the collaborative development of solutions.

Content:

The module consists of seminar-style instruction (lecture/2 contact hours per week) and practical exercises (2 contact hours per week) and covers the following topics:

variables and introductory Python programs, data types, input and output, calculations, general control

Literature:

- Guleria, P. (2024) Basics of Python Programming: Learn Python in 30 days (Beginner's approach), BPB Publications 2025
- Mastrodomenico, R. (2022) The Python book, Springer Vieweg, 2020
- B. Klein, Einführung in Python 3 für Ein- und Umsteiger, 4. Auflage, C. Hanser Verlag 2021
- M. Weigend, Python 3 für Studium und Ausbildung, mitp Verlag 2022
- H.-B. Woyand, Python für Ingenieure und Naturwissenschaftler, 4. Auflage, C. Hanser Verlag 2021
- S. Dörn, Python lernen in abgeschlossenen Lerneinheiten, 2. Auflage, Springer Vieweg 2020

2.2 Qualifikation I

German for Beginner

Module abbreviation:	ASE-Deutsch für Anfänger (DfA)	**Reg.no.:**	
Curriculum:	**Programme**	**Module type**	**Semester**
	Bachelor Applied Sustainable Engineering (SPO SS 26)	basics compulsory module	1

Responsible for module:	Wilisch, Christian
Lecturers:	Lutz, Katja
Language of instruction:	English
Credit points / SWS:	10 ECTS / 8 SWS
Workload:	Contact hours: 112 h Self-study: 188 h Total: 300 h
Subjects of the module:	German for Beginner
Lecture types:	SU/Ü - Seminar-based teaching/exercise
Examinations:	oral exam, 20 minutes (electronic remote exam § 2 Abs. 3 BayFEV) Prerequisite for the granting of credit points is the passing of the respective module examination in accordance with the SPO resp. study plan.

Prerequisites according examination regulation:

According to the SPO or curriculum

Recommended prerequisites:

None

Objectives:

Upon successful completion of the module, students will have reached level A2.1 of the Common European Framework of Reference for Languages (CEFR), having started the course with little or no prior knowledge.

Students can manage simple everyday situations in German, introduce themselves and others, and ask and answer simple questions about themselves (e.g. place of residence, family, occupation).

They understand familiar everyday expressions and very basic phrases aimed at the satisfaction of concrete needs, both in listening and reading comprehension.

Students can write short, simple notes and messages, as well as short, simple texts on familiar topics.

They master the basic grammatical structures of German (including sentence structure, verb conjugation in the present and present perfect tenses, articles and declension, modal verbs) as well as a basic vocabulary for everyday situations.

Students gain intercultural competence and are able to communicate appropriately in simple social situations of everyday life in German-speaking countries (e.g. shopping, dealing with administrative offices, university life).

Content:

A1: Greetings and introductions (name, origin, languages), the alphabet and pronunciation, numbers, expressions of time (time of day, days of the week, dates), family and describing people, housing and furnishings, shopping and food, daily routines and leisure activities, getting around town (directions, means of transport), eating and drinking/dining out.

A2.1: Study and work (university life, job applications, internships), health and the body (visiting a doctor, ailments), travel and holidays, looking for accommodation, talking about the past (present perfect and simple past of modal and auxiliary verbs), expressing plans and wishes, comparisons (comparative/superlative), making phone calls and arranging appointments, intercultural topics relating to everyday life in German-speaking countries. Grammar focus: definite/indefinite articles and negation, personal pronouns, conjugation of regular and irregular verbs in the present tense, separable verbs, modal verbs, possessive determiners, prepositions with the accusative and dative, two-way prepositions, present perfect with haben/sein, simple subordinate clauses (weil, dass, wenn).
Literature:
• Netzwerk neu A1/A2, Klett Verlag (Kurs- und Übungsbuch, Intensivtrainer) • Ergänzende Materialien und Übungen werden über die Lernplattform der Hochschule bereitgestellt

Foreign language / other qualifications

Advanced Writing and Cultural Studies

Module abbreviation:	ASE-Advanced Writing and Cultural Studies	**Reg.no.:**	
Curriculum:	**Programme**	**Module type**	**Semester**
	Bachelor Applied Sustainable Engineering (SPO SS 26)	basics compulsory module	1

Responsible for module:	McIntosh, Sabine
Lecturers:	McIntosh, Sabine
Language of instruction:	English
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 22 h Self-study: 128 h Total: 150 h
Subjects of the module:	Advanced Writing and Cultural Studies
Lecture types:	SU/Ü - Seminar-based teaching/exercise
Examinations:	wirtten exam, 90 minutes (electronic remote exam § 2 Abs. 1 BayFEV) Prerequisite for the granting of credit points is the passing of the respective module examination in accordance with the SPO resp. study plan.

Prerequisites according examination regulation:

According to the SPO or curriculum

Recommended prerequisites:

None

Objectives:

Professional and methodological competence

- Acquisition of the ability to work in an international/English-speaking company by consolidating technical terminology

Operational competence

- Consolidation of written and oral communicative competence in the foreign language

Social competence

- Ability to integrate in international companies by acquiring in-depth language skills and knowledge of intercultural aspects

Content:

- Analysis and discussion of texts dealing with the economic sector or cultural aspects
- Superior understanding of the writing process and writing techniques (memos, reports, minutes etc.)
- Stylistic elements of text production and creative writing with special regard to sentence structure and punctuation
- Analysis and evaluation of differences in intercultural communication

• Who are we - cultural backgrounds, attitudes and values • Identifying the challenges faced by people working in an intercultural environment • Dimensions of culture: some models
Literature:
• Unterrichtsskripte in Moodle • Einsatz von Online-, Bild- und Audiomaterialien im Sprachlabor

Spanish 1 for Beginners

Module abbreviation:	ASE-Spanisch 1 für Anfänger	**Reg.no.:**	
Curriculum:	**Programme**	**Module type**	**Semester**
	Bachelor Applied Sustainable Engineering (SPO SS 26)	basics compulsory module	1

Responsible for module:	Gebhard, Christian Alexander
Lecturers:	Schmidt, Marcela
Language of instruction:	Spanish
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 48 h Self-study: 102 h Total: 150 h
Subjects of the module:	Spanish 1 for Beginners
Lecture types:	SU/Ü - Seminar-based teaching/exercise
Examinations:	wirtten exam, 90 minutes (electronic remote exam § 2 Abs. 1 BayFEV) Prerequisite for the granting of credit points is the passing of the respective module examination in accordance with the SPO resp. study plan.

Prerequisites according examination regulation:

According to the SPO or curriculum

Recommended prerequisites:

None

Objectives:

Subject-Specific and Methodological Competence:

Students have a basic knowledge of lexicon, morphology, syntax, and pragmatics.

Practical Competence:

Students are able to communicate effectively in simple, everyday situations.

Social Competence:

Ability to work in a team and communicate effectively; ability to ask for help appropriately during the communication process.

Content:

This module covers the fundamentals of language use and cultural knowledge.

The module consists of active, seminar-style instruction.

The four basic skills—listening comprehension, speaking, reading comprehension, and writing—are taught at a foundational level, with a focus on speaking, reading, and listening comprehension. The content centers on everyday situations (introductions, asking for and giving information—especially when shopping and asking for directions—and general conversation).

The following grammatical topics are covered, at a minimum:

- Pronunciation rules and basic spelling rules
- Agreement (between subject and verb, noun and adjective)

- Personal, demonstrative, possessive, and interrogative pronouns (introductory)
- Use of direct and indirect objects (introductory)
- Progressive tense
- Regular and irregular verbs (vowel changes) in the present tense
- Perfect tense
- Periphrastic structures (introductory)
- Comparative and superlative forms (introductory)
- Imperative (introductory)

Literature:

- Estudiantes.ELE Plus A1-A2 (Klett)

2.3 Qualifikation II

Intermediate German			
Module abbreviation:	ASE-Deutsch Mittelstufe	**Reg.no.:**	
Curriculum:	**Programme**	**Module type**	**Semester**
	Bachelor Applied Sustainable Engineering (SPO SS 26)	basics compulsory module	2

Responsible for module:	Wilisch, Christian
Lecturers:	Hässlein, Sonali
Language of instruction:	English
Credit points / SWS:	10 ECTS / 8 SWS
Workload:	Contact hours: 90 h Self-study: 210 h Total: 300 h
Subjects of the module:	Intermediate German
Lecture types:	SU/Ü - Seminar-based teaching/exercise
Examinations:	written exam, 90 minutes Prerequisite for the granting of credit points is the passing of the respective module examination in accordance with the SPO resp. study plan.

Prerequisites according examination regulation:

According to the SPO or curriculum

Recommended prerequisites:

None

Objectives:

Students will develop the ability to understand the language in a wide range of general and academic contexts through written and spoken communication of simple to intermediate complexity. They will be able to use the language appropriately and effectively.

The course also promotes development of learning strategies that enable students to improve and expand their language proficiency independently.

Content:

Development and enhancement of language skills: listening comprehension, reading comprehension, speaking, writing, grammar and vocabulary.

Engagement with practical everyday situations: role-play activities, television programmes and other authentic language materials.

Literature:

- Lehrbuch
- Zusatzmaterial

Foreign language / other qualifications

Chinese 1 (for Beginners)

Module abbreviation:	ASE-Chinesisch 1 (für Anfänger)	**Reg.no.:**	
Curriculum:	**Programme**	**Module type**	**Semester**
	Bachelor Applied Sustainable Engineering (SPO SS 26)	basics compulsory module	2

Responsible for module:	Gebhard, Christian Alexander
Lecturers:	Gebhard, Christian Alexander
Language of instruction:	Chinese
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 48 h Self-study: 102 h Total: 150 h
Subjects of the module:	Chinese 1 (for Beginners)
Lecture types:	SU/Ü - Seminar-based teaching/exercise
Examinations:	seminar paper (outside the examination) Prerequisite for the granting of credit points is the passing of the respective module examination in accordance with the SPO resp. study plan.

Prerequisites according examination regulation:

According to the SPO or curriculum

Recommended prerequisites:

None

Objectives:

Knowledge:

The students have knowledge about the lexical and morphological structure of Chinese, understand its script and phonological characteristics. They have a passive vocabulary of around 250 lexical items and are familiar with basic syntactic structures.

Professional Skills:

The students are able to get along in uncomplicated informal situations, using digital tools to communicate in Chinese.

Social Skills:

Students work together in groups and with a partner in a respectful and efficient way.

Content:

Linguistic structures: recognition of phonemic sounds, appropriate production of consonants and vowels. Introduction to the writing system, character analysis including components, and awareness of cultural differences.

Mastery of some basic communicative tools for introductions, getting to know each other, shopping, ordering food and asking/giving simple information.

Recognition of important characters used in daily life.

Basic rules of behavior in a social context in the area of introducing and getting to know someone; introduction of important concepts such as "face" and modesty.

Introduction to tools for studying Chinese and communicating orally and in writing in Chinese (dictionary use, using input methods for Chinese characters on electronic devices, etc.). Ability to make oneself understood in uncomplicated situations based on at least 250 terms. Comprehension of simple dialogues and awareness of purely phonetic listening comprehension. Handwriting of about 50 characters.
Literature:
• Lóng neu A1-A2. Chinesisch für Anfänger. Kursbuch + 2 Audio-CDs ISBN 978-3-12-528960-4 • Lóng neu A1-A2. Übungsbuch ISBN 978-3-12-528961-1 • Lóng neu A1-A2 Extra. Übungen zur chinesischen Schrift ISBN 978-3-12-528854-6

French 1 (for Beginners)

Module abbreviation:	ASE-Französisch 1 (für Anfänger)	**Reg.no.:**	
Curriculum:	**Programme**	**Module type**	**Semester**
	Bachelor Applied Sustainable Engineering (SPO SS 26)	basics compulsory module	2

Responsible for module:	McIntosh, Sabine
Lecturers:	Emrich, Sabine
Language of instruction:	German
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 45 h Self-study: 105 h Total: 150 h
Subjects of the module:	French 1 (for Beginners)
Lecture types:	SU/Ü - Seminar-based teaching/exercise
Examinations:	written exam, 90 minutes Prerequisite for the granting of credit points is the passing of the respective module examination in accordance with the SPO resp. study plan.

Prerequisites according examination regulation:

According to the SPO or curriculum

Recommended prerequisites:

None

Objectives:

Professional and methodological competence:

Students

- acquire a basic knowledge of French vocabulary and grammar
- can understand simple, short texts and audio recordings relating to familiar everyday situations
- can communicate on familiar topics using simple expressions and sentences
- can write simple messages and fill in forms with personal details
- can apply the grammatical concepts covered in structured exercises as well as in free writing and speaking

Operational competence

Students

- can communicate, both orally and in writing, using simple linguistic means in familiar, straightforward everyday conversational situations
- can compare simple everyday aspects of French culture with those of their own culture of origin and behave appropriately in these contexts

Social competence

Students

- work cooperatively in pairs and small groups to be able to communicate and interact in academic and professional life
- acquire a basic ability to integrate through fundamental knowledge of the French language
- become aware of intercultural differences trough studying cultural aspects

Content:

The four core skills – listening comprehension, speaking, reading comprehension and writing – are taught at a basic level, with a focus on speaking, reading and listening comprehension.

The course centres on everyday topics and their idiomatic expressions, primarily in conversational situations:

- Greeting people, introducing oneself, asking how someone is
- Asking about and providing information on where someone lives, their occupation and where they work
- Describing a town, asking for directions, describing a route using public transport
- Shopping for food, shops and their products
- Asking for and giving the time, the time of day and opening hours
- Ordering in a restaurant and reviewing the meal (introductory)

Authentic, simple, short audio and video texts on everyday situations

Short, simple reading texts, including those on topics relevant to the country and cross-cultural understanding

Vocabulary is developed to enable conversations on everyday topics.

The following grammatical points are covered as a minimum:

- Pronunciation rules and the basics of spelling, 'liaison', phonetics
- Definite and indefinite articles, the partitive article, expressions of quantity
- plural forms of nouns
- subject pronouns, stressed pronouns (moi, toi, vous)
- interrogative sentences
- the verbs 'être/avoir/faire/aller/prendre'
- modal verbs
- regular verbs
- adjectives
- prepositions of place and time

Literature:

- JAMBON, Krystelle, Susanne SCHAUF und Jacqueline SWORD, 2013, Voyages neu A1: Kurs- und Übungsbuch, Klett Sprachen GmbH

Spanish 2 (Advanced)

Module abbreviation:	ASE-Spanisch 2 (für Fortgeschrittene)	**Reg.no.:**	
Curriculum:	**Programme**	**Module type**	**Semester**
	Bachelor Applied Sustainable Engineering (SPO SS 26)	basics compulsory module	2

Responsible for module:	Gebhard, Christian Alexander
Lecturers:	Castañeda Martínez, Aaron
Language of instruction:	Spanish
Credit points / SWS:	5 ECTS / 4 SWS
Workload:	Contact hours: 48 h Self-study: 102 h Total: 150 h
Subjects of the module:	Spanish 2 (Advanced)
Lecture types:	SU/Ü - Seminar-based teaching/exercise
Examinations:	seminar paper (outside the examination) Prerequisite for the granting of credit points is the passing of the respective module examination in accordance with the SPO resp. study plan.

Prerequisites according examination regulation:

According to the SPO or curriculum

Recommended prerequisites:

None

Objectives:

Subject-Specific and Methodological Competence:

Students possess a solid knowledge of lexicon, morphology, syntax, and pragmatics.

Practical Competence:

Students are able to communicate effectively in everyday situations, including in more formal contexts.

Social Competence:

Ability to work in a team and communicate effectively; ability to appropriately ask for help during the communication process

Content:

This module builds on the fundamentals of language use and knowledge of the host country.

The module consists of active, seminar-style instruction.

The four basic skills are developed, and written expression is practiced more intensively (commenting on texts, presenting pros and cons, and drafting first letters). In addition to general topics, special attention is given to the use of materials related to the country's culture.

The following grammatical topics are covered, at a minimum:

- Indefinite verb forms (regular and irregular)
- Imperfect (regular and irregular)

• Potential (introduction) • Future (introduction) • Use of direct and indirect objects (in-depth study) • Imperative (in-depth study) • Personal, demonstrative, possessive, and relative pronouns (in-depth study)
Literature:
• Estudiantes.ELE Plus A1-A2 (Klett)