

## Study regulations of the FH Bachelor Degree

### **Energy & Sustainability Management**

To obtain the academic degree

Bachelor of Arts in Business,  
abbreviated BA

as an appendix to the statutes of the FH Kufstein Tirol

**Organizational form:** Full-time

**Duration:** 6 semesters

**Scope:** 180 ECTS

**Places for beginners per academic year:** 20 Full-time

## Table of Contents

<b>1</b>	<b>Occupational profiles .....</b>	<b>3</b>
1.1	<i>Occupational fields.....</i>	3
1.2	<i>Qualification profile .....</i>	4
<b>2</b>	<b>Curriculum.....</b>	<b>6</b>
2.1	<i>Curriculum Data .....</i>	6
2.2	<i>Curriculummatrix .....</i>	7
2.3	<i>Modularization.....</i>	10
2.4	<i>Internship .....</i>	50
2.5	<i>Semester Abroad.....</i>	50
<b>3</b>	<b>Admission requirements .....</b>	<b>51</b>

**With the amendment to the University Act 2020, the so-called "University of Applied Sciences Studies Act (FHStG)" has been renamed "University of Applied Sciences Act (FHG)". Accordingly, a necessary editorial adjustment was made in this document on January 13th, 2021 and the name FHStG was replaced by FHG.**

# **1 OCCUPATIONAL PROFILES**

## **1.1 Occupational fields**

Students have access to a wide variety of professional fields of activity thanks to the wide range of subjects covered by the qualification profile. The following fields of activity describe selected areas of application and tasks for which graduates of the Energy & Sustainability Management course qualify.

### **Energy Trading**

Since the liberalization of the energy industry, energy trading has become increasingly important and trading volumes have increased continuously. New aspects such as virtual power plants and procurement communities are constantly emerging. In this context, portfolio management and the associated stock exchange and OTC trading forms a particular field of activity for experts in the energy industry. Its main tasks include researching and analyzing various market sectors of the wholesale energy markets and implementing the trading strategy defined by the company. In doing so, they use the market reports of consulting companies or support them in their preparation. In addition, graduates also work on marketing regional power plant capacities. This may concern, for example, the direct marketing of renewable energy systems along with the marketing of virtual power plants on the short-term and balancing energy markets.

### **Sales management for energy & sustainability**

The energy turnaround and the digitalization of energy distribution, with the roll-out of smart meters to the smart grid, as industry-wide trends keep demanding new innovative business models. This is the only way for companies to successfully compete for end customers in supplying electricity and gas. Graduates are in demand as managers for product developments and product innovations in the field of electricity and natural gas. On the way to a market-ready product, they are responsible for potential analyses and support the creation of business cases and marketing strategies. In this context, customer insights are playing an increasingly important role in identifying and analyzing market trends and customer needs in order to develop sustainable digital business models.

### **Energy & Sustainability Consulting**

Energy consulting and, subsequently, energy services are playing an increasingly important role in the energy sector and industry due to the national and EU-wide energy efficiency targets. Consultants' fields of activity primarily include working on customer projects with a focus on sustainability management. Their tasks include the identification of site specifics and process recording with digital methods in order to develop innovative solutions and concepts for measures in the field of energy efficiency and energy services from the data obtained. Consultants are guided by standards and procedures such as ISO 50001 and ISO 14001. Furthermore, the consultants form the interface to the customer, to whom they present solutions and products and are also available as contact people for all project-related issues. The sustainable design of mobility is playing an increasingly important role in the sense of a holistic energy concept. Graduates are involved in developing innovative mobility concepts.

### **Municipal Sustainability Management**

The establishment of regional-decentralized, regenerative energy supply and the expansion of the Smart Grid enable entirely new regional energy concepts. Graduates develop sustainable solutions for future regional energy and mobility supply. They implement sustainable refurbishment concepts in the building

sector. Special attention is paid to an integrated energy supply of municipalities with electricity, heating and cooling.

The demand for graduates comes from regional energy suppliers, energy advice centers and the municipal administration.

### **Project Management Energy Plants**

The construction along with the optimization of decentralized energy generation plants, i.e. plants for combined heat and power generation and renewable energies, is playing an increasingly important role in the course of the energy turnaround. The tasks of experts in the field of energy management and sustainability include the implementation and preparation of site analyses, demand analyses and energy concepts. The main focus lies on the economic comparison and sustainability aspects of different generation technologies as a basis for the development of a project. In addition, the experts also take on the coordination of interdisciplinary project teams, where the focus lies on the management of internal project interfaces with regard to technical, business-related and legal work packages.

## **1.2 Qualification profile**

The qualification aims and learning outcomes of the Bachelor degree program in Energy & Sustainability Management correspond both to the academic and professional requirements and to *ISCED level 0788<sup>1</sup>* (International Standard Classification of Education). The contents conveyed qualify the graduates for the professional fields of activity mentioned in the previous chapters. The main focus of the course lies in the fundamental technical, economic and legal contexts of the industry as well as in imparting knowledge of quantitative and qualitative approaches in the field of scientific methods for the implementation and application of business-related and academic problems, analyses and research work. In particular, methods and concepts that are generally necessary for solving problems in the energy industry, energy technology and in the sustainability sector are dealt with. In addition, there are complementary skills in the Social Skills and Foreign Languages modules. The application of specialist knowledge and feedback from current practice and research takes place in the practical transfer module with practical projects and the professional internship. Integration and transfer from the field of research takes place within the framework of the module Scientific and Empirical Methods on the one hand and the two modules Practice Project I/II on the other.

The following matrix is intended to serve as a graphic representation for Table 4, which lists the occupational fields of activity with the required competences (black fields).

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<sup>1</sup> *Example 4: A program consisting of 40% engineering (071), 30% business (041) and 30% languages (023) should be classified as 0788 (“Inter-disciplinary programs and qualifications involving engineering, manufacturing and construction”) as no field predominates but 07 is the leading broad field. If engineering and business were equally important and greater than languages (e.g. 40%, 40% and 20%), the program would be classified as either 0788 or 0488 depending on which program, engineering (071) or business (041), is listed first in the program title (or, if not in the title, in the curriculum or syllabus).*

Occupational fields	Core Competencies									
	Digitization in Energy & Sustainability Management	Energy Audit	Regenerative Energy Production	Innovative Mobility Concepts	Energy & Sustainability Audit	Regional Energy Concepts	Smart Energy Systems	Energy Markets	Investment & Financing	Innovation Management
Energy Trading										
Sales management for energy & sustainability										
Energy & Sustainability Consulting										
Municipal Sustainability Management										
Project Management Energy Plants										

The following table shows the respective occupational fields of activity and their defined tasks as well as the associated competences. The corresponding modules are assigned to the listed competences.

## 2 CURRICULUM

### 2.1 Curriculum Data

	FT	Comment if applicable
<b>First year of study</b> (YYY/YY+1)	2020/21	
<b>Standard duration of study</b> (number of semesters)	6	
<b>Obligatory WSH</b> (Total number for all sem.)	64	In the FT program, a semester abroad with weekly semester hours of the respective partner universities takes place within the specified weekly semester hours.
<b>Course weeks per semester</b> (number of weeks)	15	
<b>Obligatory course hours</b> (Total for all sem.)	960	In the full-time program, a semester abroad with contact hours of the respective partner universities takes place within the specified weekly semester hours.
<b>Obligatory ECTS</b> (Total for all sem.)	180	
<b>WS start</b> (Date, comm.: poss. CW)	CW 40	
<b>WS end</b> (Date, comm.: poss. CW)	CW 7	
<b>SS start</b> (Date, comm.: poss. CW)	CW 10	
<b>SS end</b> (Date, comm.: poss. CW)	CW 28	
<b>WS weeks</b>	15	
<b>SS weeks</b>	15	
<b>Obligatory semester abroad</b> (semester specification)	3rd semester	
<b>Language of instruction</b> (specify)	German/English	The proportion of English-language courses amounts to 22.73% of the WSH
<b>Professional internship</b> (semester, duration in weeks - at 40 hours per week - per semester)	6th semester 12 weeks	

## 2.2 Curriculummatrix

The following description of the modules does not include the work involved in supervising Bachelor theses. 0.2 weekly semester hours are planned per supervised thesis, i.e. for 20 students an additional 4 thesis weekly semester hours, which are incurred in the 6th semester. In total, an AWSH sum of 101.11 AWSH is achieved over all 6 semesters.

Depending on the learning and teaching method, group divisions are necessary within the individual modules. Since these are usually not valid for the entire module, the curriculum matrix gives the mean value of the number of groups, weighted according to the ratio of learning and teaching methods with and without group divisions.

### 1st semester

Module no.	Module designation	Module type	T	E	eLV	WSH	No. of groups	AWSH	ALVS	MODULE	ECTS
ENM.1	Fundamentals of Energy & Sustainability Management	ILV			30%	3.5	1	3.5	52.5	ENM	7
SPR.1	Foreign Language I	ILV			15%	2	2	4	60	SPR.1	3
TEC.1	Fundamentals of Energy Technology	ILV	X		30%	3.5	1	3.5	52.5	TEC.1	7
TEC.2	Principles of Electrical Engineering	ILV	X		30%	3	1.67	5.01	75.15	TEC.2	6
WIS.1	scientific and Empirical Methods	ILV			50%	3.5	1.3	4.55	68.25	WIS.1	7
Total line:								15.5	20.56	308.40	30
Course hours = Total WSH x module weeks								232.5			

### 2nd semester

Module no.	Module designation	Module type	T	E	eLV	WSH	No. of groups	AWSH	ALVS	MODULE	ECTS
DIT	Digitization in Energy & Sustainability Management (E)	ILV	X	X	30%	4.5	1.7	7.65	114.75	DIT	9
ECO.1	Introduction to Business Administration and Economics (E)	ILV		X	30%	3	1	3	45	ECO.1	6
ECO.2	Innovation management	ILV			30%	2	1.5	3.0	45.0	ECO.2	4
SPR.2	Foreign Language II	ILV			15%	4	2	8	120	SPR.2	5
TEC.3	Regenerative Energy Production	ILV	X		30%	3	1.5	4.5	67.5	TEC.3	6
Total line:								16.5	26.15	392.25	30
Course hours = Total WSH x module weeks								247.5			

**3rd semester**

Module no.	Module designation	Module type	T	E	eLV	WSH	No. of groups	AWSH	ALVS	MODULE	ECTS
ECO.3	Selected Topics Business Administration	ILV			0%	0	1	0	0	ECO.3	8
SOC.1	Selected Topics Social skills and Presentation	ILV			0%	0	1	0	0	SOC.1	7
VWL	Selected Topics Economics	ILV			0%	0	1	0	0	VWL	10
WIS.2	Selected Topics on Scientific and Empirical Methods	ILV			0%	0	1	0	0	WIS.2	5
Total line:						0		0	0		30
Course hours = Total WSH x module weeks						0					

**4th semester**

Module no.	Module designation	Module type	T	E	eLV	WSH	No. of groups	AWSH	ALVS	MODULE	ECTS
EMI	Energy Markets	ILV			30%	2	1	2	30	EMI	4
IMK	Innovative Mobility Concepts	ILV	X		30%	3	1.5	4.5	67.5	IMK	6
PRX.1	Practical Project I	ILV	X		15%	3	2.3	6.9	103.5	PRX.1	6
TEC.4	Regional Energy Concepts	ILV	X		30%	2.5	1	2.5	37.5	TEC.4	5
TEC.5	Smart Energy Systems	ILV	X		30%	4.5	1	4.5	67.5	TEC.5	9
Total line:						15.0		20.4	306.0		30
Course hours = Total WSH x module weeks						225.0					

**5th semester**

Module no.	Module designation	Module type	T	E	eLV	WSH	No. of groups	AWSH	ALVS	MODULE	ECTS
AUD.1	Energy & Sustainability Audit	ILV	X		30%	3.5	1	3.5	52.5	AUD.1	7
AUD.2	Energy Audit (E)	ILV	X	X	20%	5	2.2	11.0	165.0	AUD.2	10
ECO.4	Investment & Financing	ILV			30%	2	1	2	30	ECO.4	4
PRX.2	Practical Project II	ILV	X		0%	2.5	2.6	6.50	97.50	PRX.2	5
SPR.3	Foreign Language III	ILV			15%	3	2	6	90	SPR.3	4
Total line:						16.0		29.00	435.00		30
Course hours = Total WSH x module weeks						240.0					



<b>6th semester</b>
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Module no.	Module designation	Module type	T	E	eLV	WSH	No. of groups	AWSH	ALVS	MODULE	ECTS
PRX.3	Internship	BPR	X		100%	0.5	1	0.5	7.5	PRX.3	20
WIS.3	Bachelor Thesis Seminar	ILV	X		50%	0.5	1	0.5	7.5	WIS.3	10
Total line:								1.0	15.0		30
Course hours = Total WSH x module weeks								15.0			

Abbreviations	
eLV	E-learning proportion of course in percent
E	Lecture in English language
ECTS	ECTS – Credit points
LV	Course
LVS	Course hour(s)
WSH	Weekly semester hour(s)
T	Lecture with technical background

### Summary of curriculum data

Description	WSH	AWSH	ALVS	ECTS
Total number of courses over all semesters	64	97.11	1456.65	180
Total number of courses in 1st year of study	32	46.71	700.65	60
Total number of courses in 2nd year of study	15	20.4	306	60
Total number of courses in 3rd year of study	17	30	450	60
Total number of technical events over all semesters	39			106
Percentage of technical courses over all semesters based on WSH / ECTS	60.94%			58.89%
Total number of courses in English over all semesters	12.5			25
Proportion of courses in English over all semesters based on WSH / ECTS	22.73%			14.88%
Proportion of eLearning units over all semesters based on WSH	27.03%			31.78%

## 2.3 Modularization

Module number:	Fundamentals of Energy & Sustainability Management	Scope:	
ENM		7	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	1st semester		
Level	1st semester: Introduction		
Previous knowledge	1st semester: no		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Fundamentals of Energy &amp; Sustainability Management /ILV / Course no.: ENM.1 / 1st semester /</u> <ul style="list-style-type: none"> <li>• Joos, F., 2019. Nachhaltige Energieversorgung. Wiesbaden: Springer Fachmedien</li> <li>• Konstantin, P., 2017. Praxisbuch Energiewirtschaft: Energieumwandlung, -transport und -beschaffung im liberalisierten Markt. 4th edition. Berlin: Springer-Verlag</li> <li>• Klees A., 2012. Einführung in das Energiewirtschaftsrecht. Deutscher Fachverlag</li> <li>• Hering, E. und Schultz, W., 2018. Umweltschutztechnik und Umweltmanagement: Ein Kompendium für Studierende, Praktiker und Politiker. Wiesbaden: Springer Vieweg</li> <li>• Förtsch, G. and Meinholz, H., 2018. Handbuch Betriebliches Umweltmanagement. Wiesbaden: Springer Vieweg</li> <li>• Ennöckl, D., Raschauer, W., Wessely, W., 2019. Handbuch Umweltrecht. Vienna: Facultas</li> <li>• Brugger-Gebhardt, S., 2016. Die DIN EN ISO 9001:2015 verstehen: Die Norm sicher interpretieren und sinnvoll umsetzen. Berlin: Springer Gabler</li> </ul>		
Skills acquisition	<u>Fundamentals of Energy &amp; Sustainability Management /ILV / Course no.: ENM.1 / 1st semester /</u> <p>The students are able to:</p> <ul style="list-style-type: none"> <li>• Name basic terms of the energy industry and sustainability</li> <li>• Classify developments in the energy industry and sustainability</li> <li>• Describe and compare global, national, regional and corporate sustainability goals in an exemplary manner</li> <li>• Name goals and actors in energy and environmental law</li> <li>• Assign energy and environmental legislation and regulations at national and European level to the appropriate bodies</li> <li>• Explain definitions of quality in relation to Energy &amp; Sustainability Management and present the requirements and tasks of quality management systems</li> </ul>		
Course contents	<u>Fundamentals of Energy &amp; Sustainability Management /ILV / Course no.: ENM.1 / 1st semester /</u> <ul style="list-style-type: none"> <li>• Historical development and future challenges of the energy industry, environmental protection and sustainability</li> <li>• Stakeholders of the energy industry, environmental protection and sustainability</li> <li>• Ecological, economic and social aspects of sustainability</li> <li>• Basic concepts of the energy industry</li> <li>• UN Sustainability Goals as well as exemplary national, regional sustainability goals and sustainability objectives of companies</li> <li>• Basics of quality management according to ISO 9001</li> <li>• Structure and organization of a quality management system</li> <li>• Definition of quality in relation to Energy &amp; Sustainability Management</li> <li>• Guidelines of European energy and environmental policy</li> <li>• Guidelines and fundamentals of energy and environmental law</li> <li>• Promotion of renewable energies and sustainable developments</li> </ul>		
Teaching and learning methods	<u>Fundamentals of Energy &amp; Sustainability Management /ILV / Course no.: ENM.1 / 1st semester /</u> <p>Blended Learning</p>		
Evaluation Methods Criteria	<u>Fundamentals of Energy &amp; Sustainability Management /ILV / Course no.: ENM.1 / 1st semester /</u> <p>Written exam</p>		

Module number:	Foreign Language I	Scope:	
		3	ECTS
SPR.1			
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	1st semester		
Level	1st semester: Introduction or consolidation		
Previous knowledge	1st semester: French, Italian, Spanish Module with objective A2: no previous knowledge allowed Module with objective B2: Previous knowledge required Chinese, Russian Module with objective A2: no previous knowledge allowed English Module with objective B2: Level B1 (GER) or English advanced course required Module with objective C1: Level B2 (GER) required Module with objective C2: Level C1 (GER) required		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Foreign Language I /ILV / Course no.: SPR.1 / 1st semester / ECTS: 3</u> Course book - by arrangement; authentic materials, e.g. from English language journals (including specialist journals), newspapers and online media		
Skills acquisition	<u>Foreign Language I /ILV / Course no.: SPR.1 / 1st semester / ECTS: 3</u> <p>The Foreign Language I, II and III modules are designed according to the Common European Framework of Reference for Languages (CEFR). In the three modules, students will acquire the language skills and develop the skills necessary for a business-oriented professional or academic activity.</p> <p>According to the CEFR, the following competences are taught in the three consecutive Foreign Language I, II and III modules, depending on the language chosen and building on the students' existing prior knowledge:</p> <p><b>A1 - Beginners</b>            The students are able to:</p> <ul style="list-style-type: none"> <li>• understand and use familiar, everyday expressions and very simple sentences aimed at satisfying specific needs</li> <li>• introduce themselves and others and ask other people questions about themselves</li> <li>• e.g. where they live, what kind of people they know or what things they have, and to answer questions of this kind</li> <li>• communicate in a simple way if the interlocutor speaks slowly and clearly and is prepared to help</li> </ul> <p><b>A2 - Basic knowledge</b>            Students are able to:</p> <ul style="list-style-type: none"> <li>• understand sentences and frequently-used expressions related to areas of most immediate relevance (e.g. personal and family information, shopping, work, local area)</li> <li>• communicate in simple, routine situations involving a simple and direct exchange of information on familiar and routine matters</li> <li>• describe in simple terms their own background and education, immediate environment and matters relating to immediate needs</li> </ul> <p><b>B1 - Advanced Language Use</b>            Students are able to:</p> <ul style="list-style-type: none"> <li>• understand the main points of clear standard language use and familiar matters related to work, school, leisure, etc.</li> <li>• cope with most situations encountered when traveling in the language area</li> <li>• express themselves in a simple and coherent way on familiar topics and areas of personal interest</li> <li>• report on experiences and events, describe dreams, hopes and ambitions and briefly give reasons or explanations for plans and opinions</li> </ul>		

B2 - Use language independently

Students are able to:

- understand the main ideas behind complex texts on both specific and abstract topics, as well as technical discussions in their own field of expertise
- communicate with a degree of fluency and spontaneity that makes normal conversation with native speakers easily and without strain for either party
- express themselves clearly and in detail on a wide range of subjects, explain a viewpoint on a topical issue and indicate the advantages and disadvantages of various options

C1 - Proficient language skills

Students are able to:

- understand a wide range of demanding, longer texts and also grasp implicit meanings
- express themselves spontaneously and fluently without having to search for words in a clearly recognizable way more often
- use the language effectively and flexibly in social and professional life or in training and studies
- express themselves clearly, in a structured and detailed manner on complex subjects, making appropriate use of various means of linking texts

C2 - Near-native speaker

Students are able to:

- understand with ease virtually everything they read or hear
- summarize information from different written and oral sources, giving reasons and explanations in a coherent presentation
- express him/herself spontaneously, very fluently and precisely, and clarify finer shades of meaning even in more complex situations

<p>Course contents</p>	<p><u>Foreign Language I /ILV / Course no.: SPR.1 / 1st semester / ECTS: 3</u>                  The course content depends on the students' choice of language and the classification of their previous knowledge according to the CEFR:</p> <p>A1 - Beginners</p> <ul style="list-style-type: none"> <li>• understand and use familiar, everyday expressions and very simple sentences aimed at satisfying specific needs</li> <li>• introduce yourself and others and ask other people personal questions - e.g. where they live, what kind of people they know or what things they have - and answer questions of this kind - communicate in a simple way if the interlocutor speaks slowly and clearly and is willing to help</li> </ul> <p>A2 - Basic knowledge</p> <ul style="list-style-type: none"> <li>• understand sentences and frequently-used expressions related to areas of immediate relevance (e.g. information about the person and family, shopping, work, immediate surroundings)</li> <li>• communicate in simple, routine situations involving a simple and direct exchange of information on familiar and routine matters</li> <li>• describe in simple terms their own background and education, immediate environment and matters relating to immediate needs</li> </ul> <p>B1 - Advanced language use</p> <ul style="list-style-type: none"> <li>• use clear standard language and relate to familiar matters from work, school, leisure, etc. to communicate</li> <li>• use conversational skills relevant to travel in the language area</li> <li>• express themselves in a simple and coherent way on familiar topics and personal areas of interest</li> <li>• report on experiences and events, describe dreams, hopes and ambitions and give short justifications or explanations of plans and views</li> </ul> <p>B2 - Independent language use</p> <ul style="list-style-type: none"> <li>• express themselves on both specific and abstract topics with regard to the main content of complex texts; take part in specialist discussions in their own field of specialization</li> <li>• communicate so spontaneously and fluently that a normal conversation with native speakers is easily possible without much effort on either side</li> <li>• express themselves clearly and in detail on a wide range of topics, explain a viewpoint on a topical issue and state the advantages and disadvantages of various options</li> </ul> <p>C1 - Expert language skills</p> <ul style="list-style-type: none"> <li>• understand a wide range of more demanding, longer texts and also grasp implicit meanings</li> <li>• express themselves spontaneously and fluently without having to search for words more often in a clearly recognizable way</li> <li>• use the language effectively and flexibly in social and professional life or in training and studies</li> <li>• express themselves on complex issues in a clear, structured and detailed manner, making appropriate use of various means of linking texts</li> </ul>
	<p>C2 - Near-native speaker skills</p> <ul style="list-style-type: none"> <li>• Effortless communication in all language situations</li> <li>• Summarizing information from different written and oral sources, giving reasons and explanations in a coherent presentation</li> <li>• Expressing themselves spontaneously, very fluently and precisely, making finer shades of meaning clear even in more complex situations</li> </ul>
<p>Teaching and learning methods</p>	<p><u>Foreign Language I /ILV / Course no.: SPR.1 / 1st semester / ECTS: 3</u>                  Blended Learning</p>
<p>Evaluation Methods Criteria</p>	<p><u>Foreign Language I /ILV / Course no.: SPR.1 / 1st semester / ECTS: 3</u>                  Language examination</p>

Module number:	Fundamentals of Energy Technology	Scope:	
TEC.1		7	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	1st semester		
Level	1st semester: Introduction		
Previous knowledge	1st semester: no		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<p><u>Fundamentals of Energy Technology /ILV / Course no.: TEC.1 / 1st semester / ECTS: 7</u></p> <ul style="list-style-type: none"> <li>• Mortimer, C. E. and U. Müller, 2015. Chemie: Das Basiswissen der Chemie. 12th edition Stuttgart: Thieme Verlag</li> <li>• Herr, H., E. Bach and U. Maier, 2011. Technische Physik. 5th edition, Haan: Europa-Lehrmittel</li> <li>• Cerbe, G. und G. Wilhelms, 2013. Technische Thermodynamik. 17th edition. Munich: Carl Hanser</li> <li>• Bohl, W., 2014. Technische Strömungslehre. 15th edition. Würzburg: Vogel Business Media</li> <li>• Böge, A., W. Böge and 2017. Technische Mechanik. 32nd edition. Wiesbaden: Springer Vieweg</li> </ul>		
Skills acquisition	<p><u>Fundamentals of Energy Technology /ILV / Course no.: TEC.1 / 1st semester / ECTS: 7</u></p> <p>The students are able to:</p> <ul style="list-style-type: none"> <li>• Understand the theory of chemical reactions and equilibria as well as electrochemistry</li> <li>• Know and assess the heat of combustion, exhaust gas quantities and storage capacities</li> <li>• Describe and apply the basic terms force, momentum, power and energy • Apply the conservation laws of mechanics and thermodynamics</li> <li>• Apply the basic laws of thermodynamics and fluid mechanics to questions of energy technology</li> <li>• Understand energy conversion processes and calculate technical parameters</li> </ul>		
Course contents	<p><u>Fundamentals of Energy Technology /ILV / Course no.: TEC.1 / 1st semester / ECTS: 7</u></p> <p>Electrochemistry:</p> <ul style="list-style-type: none"> <li>• Elementary types of chemical bonding</li> <li>• Stoichiometry of reaction products and reaction products</li> <li>• Combustion calculation</li> <li>• Electrochemistry</li> </ul> <p>Mechanics:</p> <ul style="list-style-type: none"> <li>• Mechanical principles of force balance and energy conservation</li> <li>• Statics of solid bodies (forces, equilibrium, stability and friction)</li> <li>• Kinetics (translation and rotation, work and power)</li> <li>• Strength theory (tension, pressure, thermal stress, surface pressure, shear, torsion and bending)</li> </ul> <p>Thermodynamics:</p> <ul style="list-style-type: none"> <li>• Thermodynamics of ideal and real gases (equations of state, theorems)</li> <li>• Cyclic processes of thermodynamics with emphasis on the water-steam cycle</li> <li>• Mechanisms of heat transfer and their technical use</li> <li>• Basic concepts of hydrostatics and hydrodynamics</li> </ul>		
Teaching and learning methods	<p><u>Fundamentals of Energy Technology /ILV / Course no.: TEC.1 / 1st semester / ECTS: 7</u></p> <p>Blended Learning</p>		
Evaluation Methods Criteria	<p><u>Fundamentals of Energy Technology /ILV / Course no.: TEC.1 / 1st semester / ECTS: 7</u></p> <p>Written exam</p>		

Module number:	Principles of Electrical Engineering	Scope:	
TEC.2		6	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	1st semester		
Level	1st semester: Introduction		
Previous knowledge	1st semester: None		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Fundamentals of Electrical Engineering /ILV / Course no.: TEC.2 / 1st semester / ECTS: 6</u> <ul style="list-style-type: none"> <li>• Tkotz, K., 2018. Fachkunde Elektrotechnik. 31st edition. Haan: Europa-Lehrmittel</li> <li>• Hagmann, G., 2019. Grundlagen der Elektrotechnik. 18th edition Wiebelsheim: AULA-Verlag</li> </ul>		
Skills acquisition	<u>Fundamentals of Electrical Engineering /ILV / Course no.: TEC.2 / 1st semester / ECTS: 6</u>  The students are able to: <ul style="list-style-type: none"> <li>• Reproduce and explain definitions of current and voltage, electric and magnetic field as well as Ohm's law and electromagnetic induction</li> <li>• Describe quantum mechanical processes of charge transport in electric semiconductors qualitatively and apply them to the photoelectric effect</li> <li>• Read plans and data sheets of electric power engineering</li> <li>• Understand basic principles of control systems and interpret the parameters of direct, alternating and three-phase current</li> <li>• Describe the function and operating behavior of electrical machines</li> <li>• Set up electrical circuits in the laboratory, operate measuring equipment and visualize measurement results</li> <li>• Question and analyze the technical interrelationships of an extensively described and delimited task in the field of electrical engineering and reproduce a solution with a given structure</li> </ul>		
Course contents	<u>Fundamentals of Electrical Engineering /ILV / Course no.: TEC.2 / 1st semester / ECTS: 6</u> <ul style="list-style-type: none"> <li>• Kirchhoff's laws</li> <li>• Basic quantities of alternating current and three-phase current</li> <li>• Reactive, active and apparent power</li> <li>• Applications of semiconductors in metrology, digital technology and power electronics</li> <li>• Description of electrical machines, motors and generators by pointer diagrams</li> <li>• Asynchronous and synchronous machines</li> <li>• Properties and structures of control loops</li> <li>• Definition of current and voltage</li> <li>• Electric and magnetic field</li> <li>• Theory of electrical conduction in doped electrical semiconductors</li> <li>• Photoelectric effect</li> <li>• Practical experimental setups in the laboratory</li> </ul> <p>The module is made up of 67% exercises. This form of teaching takes place in small groups.</p>		
Teaching and learning methods	<u>Fundamentals of Electrical Engineering /ILV / Course no.: TEC.2 / 1st semester / ECTS: 6</u> Blended learning and exercises		
Evaluation Methods Criteria	<u>Fundamentals of Electrical Engineering /ILV / Course no.: TEC.2 / 1st semester / ECTS: 6</u> Written exam		

Module number:	Scientific and Empirical Methods	Scope:	
WIS.1		7	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	1st semester		
Level	1st semester: Introduction		
Previous knowledge	1st semester: basic knowledge of the use of word processing and spreadsheet software		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Scientific &amp; Empirical Methods /ILV / Course no.: WIS.1 / 1st semester / ECTS: 7</u> <ul style="list-style-type: none"> <li>• Heisen, M. R. and M. Theisen, 2017. Wissenschaftliches Arbeiten: erfolgreich bei Bachelor- und Masterarbeit. Munich: Franz Vahlen</li> <li>• Weiz, E., 2018. Konkrete Mathematik (nicht nur) für Informatiker. Mit vielen Grafiken und Algorithmen in Python. Wiesbaden: Springer</li> <li>• Fahrmeir, L., R. Künstler, I. Pigeot, I. and G. Tutz, 2012. Statistics: Der Weg zur Datenanalyse. 7th edition. Berlin: Springer</li> <li>• Fahrmeir, L., Kneib, T. and Lang, S., 2009. Regression: Modelle, Methoden und Anwendungen. 2nd edition. Berlin: Springer</li> <li>• Ross, S., M., Statistik für Ingenieure und Naturwissenschaftler. 3rd edition. Spektrum Akademischer Verlag</li> </ul>		
Skills acquisition	<u>Scientific &amp; Empirical Methods /ILV / Course no.: WIS.1 / 1st semester / ECTS: 7</u> The students are able to: <ul style="list-style-type: none"> <li>• Describe and apply the fundamentals of academic work</li> <li>• Research, evaluate and cite specialist literature</li> <li>• Present and apply scientific methods of literature analysis</li> <li>• Describe and apply concepts and methods of descriptive and explorative statistics</li> </ul>		
Course contents	<u>Scientific &amp; Empirical Methods /ILV / Course no.: WIS.1 / 1st semester / ECTS: 7</u> Science and scientific methods <ul style="list-style-type: none"> <li>• Science and scientific language</li> <li>• Literature research</li> <li>• Citation and source work</li> <li>• Avoidance of plagiarism</li> </ul> Data analysis: <ul style="list-style-type: none"> <li>• Statistical characteristics and variables</li> <li>• Uni- and multivariate description and exploration of data</li> <li>• Correlation and regression analysis</li> <li>• Basic programming skills for data preparation</li> <li>• Analysis and presentation of information from data sets</li> </ul> The module is made up of 25% exercises. This form of teaching takes place in small groups.		
Teaching and learning methods	<u>Scientific &amp; Empirical Methods /ILV / Course no.: WIS.1 / 1st semester / ECTS: 7</u> Blended Learning		
Evaluation Methods Criteria	<u>Scientific &amp; Empirical Methods /ILV / Course no.: WIS.1 / 1st semester / ECTS: 7</u> Term paper and written exam		



Module number:	Digitization in Energy & Sustainability Management	Scope:	
DIT		9	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	2nd semester		
Level	2nd semester: Consolidation		
Previous knowledge	2nd semester: Scientific and Empirical Methods (WIS.1)		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Digitization in Energy &amp; Sustainability Management (E) /ILV / Course no.: DIT / 2nd semester /</u> <ul style="list-style-type: none"> <li>• Baun, C., 2018. Computernetze kompakt. 4th edition. Wiesbaden: Springer Vieweg</li> <li>• Sauter, M., 2015. Grundkurs Mobile Kommunikationssysteme: LTE-Advanced, UMTS, HSPA, GSM, GPRS, Wireless LAN und Bluetooth. 6th edition. Wiesbaden: Springer Verlag</li> <li>• Grus, J., 2016. Einführung in Data Science: Grundprinzipien der Datenanalyse mit Python. Sebastopol: O'Reilly Media</li> <li>• Fasel, D., A. Meier, 2016. Big Data: Grundlagen, Systeme und Nutzungspotentiale. Wiesbaden: Springer Verlag</li> <li>• Runkler, T.A., 2016. Data Analytics: Models and Algorithms for Intelligent Data Analysis. 2nd edition. Wiesbaden: Springer Verlag</li> </ul>		
Skills acquisition	<u>Digitization in Energy &amp; Sustainability Management (E) /ILV / Course no.: DIT / 2nd semester /</u> <p>The students are able to:</p> <ul style="list-style-type: none"> <li>• Present characteristics and performance parameters of various transmission technologies</li> <li>• Name systems, procedures and protocols of data transmission</li> <li>• Explain basic terms concerning economic and legal aspects of the Internet infrastructure</li> <li>• Describe contents, results/applications and working methods of Data Science</li> <li>• Apply basic functions in the processing of mass data including evaluation functions</li> <li>• Describe basic concepts of programs for evaluating large quantities of data and independently create simple program codes for evaluations</li> <li>- Apply tools for the evaluation of data</li> </ul>		
Course contents	<u>Digitization in Energy &amp; Sustainability Management (E) /ILV / Course no.: DIT / 2nd semester /</u> <ul style="list-style-type: none"> <li>• Fundamentals of data transmission</li> <li>• Technologies and applications of modern networks and data transmission</li> <li>• Performance parameters of data transmission including broadband powerline, internet nodes, backbone networks</li> <li>• Internet Protocol and domain name</li> <li>• Business models for infrastructure service providers</li> <li>• Legal requirements for infrastructure provision</li> <li>• Data protection and data security</li> <li>• Evaluation of measurement data</li> <li>• Fundamentals of time series analysis</li> </ul> <p>The module is made up of 67% exercises. This form of teaching takes place in small groups.</p>		
Teaching and learning methods	<u>Digitization in Energy &amp; Sustainability Management (E) /ILV / Course no.: DIT / 2nd semester /</u> <p>Blended Learning</p>		
Evaluation Methods Criteria	<u>Digitization in Energy &amp; Sustainability Management (E) /ILV / Course no.: DIT / 2nd semester /</u> <p>Examination and portfolio</p>		

Module number:	Introduction to Business Administration and Economics	Scope:	
ECO.1		6	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	2nd semester		
Level	2nd semester: Introduction		
Previous knowledge	2nd semester: none		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<p><u>Fundamentals of Business Administration &amp; Economics (E) /ILV / Course no.: ECO.1 / 2nd semester /</u></p> <ul style="list-style-type: none"> <li>• Vahs, D. and J. Schäfer-Kunz, 2015. Einführung in die Betriebswirtschaftslehre. 7th edition. Stuttgart: Schäffer Poeschel.</li> <li>• Thommen, J.-P. et al., 2017. Allgemeine Betriebswirtschaftslehre: Umfassende Einführung aus managementorientierter Sicht. 8th edition. Wiesbaden: Springer Gabler.</li> <li>• Schweitzer, M. and A. Baumeister, 2015. Allgemeine Betriebswirtschaftslehre. 11th edition. Berlin: Erich Schmidt Verlag.</li> <li>• Hutzschenreuter, T., 2015. Allgemeine Betriebswirtschaftslehre. 6th edition. Wiesbaden: Springer Gabler.</li> <li>• Wöhe, G., U. Döring and G. Brösel, 2016. Einführung in die Allgemeine Betriebswirtschaftslehre, 26th edition Munich: Vahlen.</li> <li>• Weber, W., R. Kabst and M. Baum, 2018: Einführung in die Betriebswirtschaftslehre, 10th edition Wiesbaden: Springer Gabler.</li> <li>• Pindyck, R. S. and D. L. Rubinfeld, 2018. Mikroökonomie. Pearson Deutschland GmbH</li> <li>• Varian, H. R., 2014. Grundzüge der Mikroökonomik. Berlin: Walter de Gruyter GmbH and Co KG.Deutschland GmbH</li> <li>• Münter, M.T., 2018. Mikroökonomie, Wettbewerb und strategisches Verhalten. Stuttgart: UTB GmbH</li> <li>• Natrop, J., 2012. Grundzüge der angewandten Mikroökonomie. Berlin: Walter de Gruyter GmbH and Co KG.Deutschland GmbH.</li> <li>• Kahneman, D., 2012. Schnelles Denken, langsames Denken. Munich: Siedler Verlag.</li> <li>• Rifkin, J., 2014. Die Null-Grenzkosten-Gesellschaft: Das Internet der Dinge, kollaboratives Gemeingut und der Rückzug des Kapitalismus. Frankfurt am Main: Campus Verlag.</li> <li>• Thiel, P., and B. Masters, 2014. Zero to one: Wie Innovation unsere Gesellschaft rettet. Frankfurt am Main: Campus Verlag.</li> <li>• Buchholz, L. and R. Gerhards, 2016. Internes Rechnungswesen, Kosten- und Leistungsrechnung, Betriebsstatistik und Planungsrechnung. Wiesbaden: Springer Gabler</li> <li>• Deimel, K. et al., 2017. Kostenrechnung, Das Lehrbuch für Bachelor, Master und Praktiker. Hallbergmoos: Pearson</li> <li>• Geirhofer, S. and C. Hebrank, 2016. Grundlagen Buchhaltung und Bilanzmanagement, 4th edition. Vienna: Linde Verlag.</li> <li>• Coenenberg, A.G. et. al., 2018. Einführung in das Rechnungswesen: Grundlagen der Buchführung und Bilanzierung, 7th edition Stuttgart: Schäffer Poeschel</li> <li>• Wedell, H. and A.A. Dilling, 2018. Grundlagen des Rechnungswesens, 16th edition Herne: NWB Studium</li> <li>• Breidenbach, K. and M. Währisch, 2017. Buchhaltung und Jahresabschluss, 4th edition. Berlin: De Gruyter Studium</li> <li>• Schmidt, M., B. Auer and P. Schmidt, 2012. Buchführung und Bilanzierung: Eine anwendungsorientierte Einführung. Wiesbaden: Springer Gabler</li> </ul>		

<p>Skills acquisition</p>	<p><u>Fundamentals of Business Administration &amp; Economics (E) /ILV / Course no.: ECO.1 / 2nd semester /</u></p> <p>The students are able to:</p> <ul style="list-style-type: none"> <li>• Describe different business-related subareas</li> <li>• Explain the fundamentals of marketing</li> <li>• Explain the fundamentals of human resources management</li> <li>• Explain the structure of a company, typical operational processes and the basic constitutive factors of a company.</li> <li>• Recognize relationships in the sense of the various relationships between business functions</li> <li>• Clearly differentiate central business terms from each other</li> <li>• Explain the most important constitutional and functional corporate decisions.</li> <li>• Handle fundamental management problems from an economic point of view</li> <li>• Analyze decisions under uncertainty</li> <li>• Develop strategic decisions on the basis of economic models</li> <li>• Assess the impact of digital technologies and products on a company's cost structure and the formation of market forms</li> <li>• Explain the fundamentals of mapping business decisions in the accounting system.</li> <li>• Explain basic terms and sub-areas of accounting</li> <li>• Understand the technique and internal structure of double-entry bookkeeping and assess the structure of an accounting system and the characteristics of different types of accounts</li> <li>• Make simple business postings to balance sheet and profit and loss accounts and create posting records</li> <li>• Identify the significant effects of business transactions on the balance sheet and income statement</li> <li>• Explain task fields and solution approaches of cost and revenue accounting with its sub-systems (cost element, cost center and cost unit accounting)</li> <li>• Distinguish between the terms deposits, disbursements, income, expenses and income</li> <li>• Explain the organizational structure of a cost accounting system and explain the main features of the main cost accounting systems</li> <li>• Explain the systems of cost accounting (partial and full cost accounting)</li> </ul>
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<p>Course contents</p>	<p><u>Fundamentals of Business Administration &amp; Economics (E) /ILV / Course no.: ECO.1 / 2nd semester /</u></p> <ul style="list-style-type: none"> <li>• Overview and context analysis of the most important subareas in business administration</li> <li>• Subject and fundamentals of business administration:             <ul style="list-style-type: none"> <li>o Operational functional areas</li> <li>o Business-related decision theory</li> <li>o Fundamentals of management and ethics</li> <li>o Fundamentals of Human Resources and organization</li> <li>o Marketing fundamentals</li> </ul> </li> <li>• Fundamentals of business-related management:             <ul style="list-style-type: none"> <li>o Constitutive company decisions such as legal forms, location decisions, types of mergers and acquisitions and choice of business segment</li> <li>o Functional company decisions: Materials management, production management, marketing</li> </ul> </li> <li>• Fundamentals of business value creation processes and functions (value creation architecture and structure)</li> <li>• Fundamentals of market-, process- and strategy-oriented management</li> <li>• Microeconomics and the behavior of managers and companies</li> <li>• Price and product policy of companies</li> <li>• Elementary principles of game theory</li> <li>• Company organization</li> <li>• Market forms and market entry</li> <li>• Decisions under uncertainty</li> <li>• Behavioral economics</li> <li>• Economy of digitization</li> <li>• External accounting:             <ul style="list-style-type: none"> <li>o Structure of the accounting system</li> <li>o Fundamentals of operational accounting: Tasks, sub-areas and basic concepts</li> <li>o Commercial accounting system: From inventory to opening balance sheet</li> <li>o Double-entry accounting system: Posting business cases to inventory and profit and loss accounts                 <ul style="list-style-type: none"> <li>o Organization of bookkeeping (chart of accounts, sales tax, etc.)</li> <li>o Principle of period purity and accruals and deferrals</li> </ul> </li> </ul> </li> <li>• Internal accounting:             <ul style="list-style-type: none"> <li>o Objectives and basic concepts of cost and revenue accounting</li> <li>o Fundamentals of cost and revenue accounting: Tasks, components and subareas</li> <li>o Structure of cost accounting (cost elements, cost centers, cost objects)</li> <li>o Contribution margin accounting</li> </ul> </li> </ul>
<p>Teaching and learning methods</p>	<p><u>Fundamentals of Business Administration &amp; Economics (E) /ILV / Course no.: ECO.1 / 2nd semester /</u></p> <p>Blended Learning</p>
<p>Evaluation Methods Criteria</p>	<p><u>Fundamentals of Business Administration &amp; Economics (E) /ILV / Course no.: ECO.1 / 2nd semester /</u></p> <p>Written exam</p>

Module number:	Innovation management	Scope:	
ECO.2		4	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	2nd semester		
Level	2nd semester: Introduction		
Previous knowledge	2nd semester: none		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Innovation management /ILV / Course no.: ECO.2 / 2nd semester / ECTS: 4</u> <ul style="list-style-type: none"> <li>• Rogers, E., 2016. Diffusion of Innovations Simon and Schuster International. 5th edition Free Press</li> <li>• Kelley, T., 2016. The Art of Innovation. Profile Books Verlag</li> <li>• Köhler-Schute, C., 2011. Wettbewerbsorientierter Vertrieb in der Energiewirtschaft: Kundenverlustprävention, neue Geschäftsfelder und Produkte, optimierte Geschäftsprozesse. 2nd edition. Berlin: KS-Energy-Verlag</li> <li>• Ströbele, W., W. Pfaffenberger and M. Heuterkes, 2012. Energiewirtschaft: Einführung in Theorie und Politik. Oldenbourg: Wissenschaftsverlag</li> <li>• Lewrick, M. et al., 2018. Das Design Thinking Playbook: Mit traditionellen, aktuellen und zukünftigen Erfolgsfaktoren. Munich: Vahlen</li> </ul>		
Skills acquisition	<u>Innovation management /ILV / Course no.: ECO.2 / 2nd semester / ECTS: 4</u> The students are able to: <ul style="list-style-type: none"> <li>• Describe innovation processes including technical innovation processes.</li> <li>• Classify the maturity levels of products and technologies</li> <li>• Identify current innovations</li> <li>• Describe Design Thinking and Open Innovation as options in the innovation process and to apply them in examples</li> </ul>		
Course contents	<u>Innovation management /ILV / Course no.: ECO.2 / 2nd semester / ECTS: 4</u> <ul style="list-style-type: none"> <li>• Phase model to describe the spread of technical innovations</li> <li>• Design Thinking</li> <li>• Open Innovation</li> <li>• Innovation management and interlocking with the technology and market management of companies</li> <li>• Success factors for innovation management projects</li> <li>• Current examples of innovations</li> </ul> <p>The module contains 50% exercises. This form of teaching takes place in small groups.</p>		
Teaching and learning methods	<u>Innovation management /ILV / Course no.: ECO.2 / 2nd semester / ECTS: 4</u> Blended Learning		
Evaluation Methods Criteria	<u>Innovation management /ILV / Course no.: ECO.2 / 2nd semester / ECTS: 4</u> Portfolio		

<b>Module number:</b>	<b>Foreign Language II</b>	<b>Scope:</b>	
<b>SPR.2</b>		<b>5</b>	<b>ECTS</b>
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	2nd semester		
Level	2nd semester: Introduction or consolidation		
Previous knowledge	2nd semester: French, Italian, Spanish Module with objective A2: no previous knowledge allowed Module with objective B2: Previous knowledge required Chinese, Russian Module with objective A2: no previous knowledge allowed English Module with objective B2: Level B1 (GER) or English advanced course required Module with objective C1: Level B2 (GER) required Module with objective C2: Level C1 (GER) required		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Foreign Language II /ILV / Course no.: SPR.2 / 2nd semester / ECTS: 5</u> Course book - by arrangement; authentic materials, e.g. from English language journals (including specialist journals), newspapers and online media		

Skills acquisition	<p><u>Foreign Language II /ILV / Course no.: SPR.2 / 2nd semester / ECTS: 5</u></p> <p>The Foreign Language I, II and III modules are designed according to the Common European Framework of Reference for Languages (CEFR). In the three modules, students will acquire the language skills and develop the skills necessary for a business-oriented professional or academic activity.</p> <p>According to the CEFR, the following competences are taught in the three consecutive Foreign Language I, II and III modules, depending on the language chosen and building on the students' existing prior knowledge:</p> <p><b>A1 - Beginners</b> The students are able to:</p> <ul style="list-style-type: none"> <li>• understand and use familiar, everyday expressions and very simple sentences aimed at satisfying specific needs</li> <li>• introduce themselves and others and ask other people questions about themselves, e.g. where they live, what kind of people they know or what things they have, and to answer questions of this kind</li> <li>• communicate in a simple way if the interlocutor speaks slowly and clearly and is prepared to help</li> </ul> <p><b>A2 - Basic knowledge</b> Students are able to:</p> <ul style="list-style-type: none"> <li>• understand sentences and frequently-used expressions related to areas of most immediate relevance (e.g. personal and family information, shopping, work, local area)</li> <li>• communicate in simple, routine situations involving a simple and direct exchange of information on familiar and routine matters</li> <li>• describe in simple terms their own background and education, immediate environment and matters relating to immediate needs</li> </ul> <p><b>B1 - Advanced Language Use</b> Students are able to:</p> <ul style="list-style-type: none"> <li>• understand the main points of clear standard language use and familiar matters related to work, school, leisure, etc.</li> <li>• cope with most situations encountered when traveling in the language area</li> <li>• express themselves in a simple and coherent way on familiar topics and areas of personal interest</li> <li>• report on experiences and events, describe dreams, hopes and ambitions and briefly give reasons or explanations for plans and opinions</li> </ul>
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Skills acquisition	<p>B2 - Use language independently Students are able to:</p> <ul style="list-style-type: none"><li>• understand the main content of complex texts on both specific and abstract topics, as well as technical discussions in their own field of specialization</li><li>• communicate so spontaneously and fluently that a normal conversation with native speakers is possible without much effort on both sides.</li><li>• express themselves clearly and in detail on a wide range of subjects, explain a viewpoint on a topical issue and indicate the advantages and disadvantages of various options</li></ul> <p>C1 - Proficient language skills Students are able to:</p> <ul style="list-style-type: none"><li>• understand a wide range of demanding, longer texts and also grasp implicit meanings</li><li>• express themselves spontaneously and fluently without having to search for words in a clearly recognizable way more often</li><li>• use the language effectively and flexibly in social and professional life or in training and studies</li><li>• express themselves clearly, in a structured and detailed manner on complex subjects, making appropriate use of various means of linking texts</li></ul> <p>C2 - Near-native speaker Students are able to:</p> <ul style="list-style-type: none"><li>• understand with ease virtually everything they read or hear</li><li>• summarize information from different written and oral sources, giving reasons and explanations in a coherent presentation</li><li>• express him/herself spontaneously, very fluently and precisely, and clarify finer shades of meaning even in more complex situations</li></ul>
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<p>Course contents</p>	<p><u>Foreign Language II /ILV / Course no.: SPR.2 / 2nd semester / ECTS: 5</u></p> <p>The course content depends on the students' choice of language and the classification of their previous knowledge according to the CEFR:</p> <p>A1 - Beginners</p> <ul style="list-style-type: none"> <li>• understand and use familiar, everyday expressions and very simple sentences aimed at satisfying specific needs</li> <li>• introduce yourself and others and ask other people personal questions - e.g. where they live, what kind of people they know or what things they have - and answer questions of this kind</li> <li>• communicate in a simple way if the interlocutor speaks slowly and clearly and is willing to help</li> </ul> <p>A2 - Basic knowledge</p> <ul style="list-style-type: none"> <li>• understand sentences and frequently-used expressions related to areas of immediate relevance (e.g. information about the person and family, shopping, work, immediate surroundings)</li> <li>• communicate in simple, routine situations involving a simple and direct exchange of information on familiar and routine matters</li> <li>• describe in simple terms their own background and education, immediate environment and matters relating to immediate needs</li> </ul> <p>B1 - Advanced language use</p> <ul style="list-style-type: none"> <li>• use clear standard language and relate to familiar matters from work, school, leisure, etc. to communicate</li> <li>• use conversational skills relevant to travel in the language area</li> <li>• express themselves in a simple and coherent way on familiar topics and personal areas of interest</li> <li>• report on experiences and events, describe dreams, hopes and ambitions and give short justifications or explanations of plans and views</li> </ul> <p>B2 - Independent language use</p> <ul style="list-style-type: none"> <li>• express themselves on both specific and abstract topics with regard to the main content of complex texts; take part in specialist discussions in their own field of specialization</li> <li>• communicate so spontaneously and fluently that a normal conversation with native speakers is easily possible without much effort on either side</li> <li>• express themselves clearly and in detail on a wide range of topics, explain a viewpoint on a topical issue and state the advantages and disadvantages of various options</li> </ul> <p>C1 - Expert language skills</p> <ul style="list-style-type: none"> <li>• understand a wide range of more demanding, longer texts and also grasp implicit meanings</li> <li>• express themselves spontaneously and fluently without having to search for words more often in a clearly recognizable way</li> <li>• use the language effectively and flexibly in social and professional life or in training and studies</li> <li>• express themselves on complex issues in a clear, structured and detailed manner, making appropriate use of various means of linking texts</li> </ul> <p>C2 - Near-native speaker skills</p> <ul style="list-style-type: none"> <li>• Effortless communication in all language situations</li> <li>• Summarizing information from different written and oral sources, giving reasons and explanations in a coherent presentation</li> <li>• Expressing themselves spontaneously, very fluently and precisely, making finer shades of meaning clear even in more complex situations</li> </ul>
<p>Teaching and learning methods</p>	<p><u>Foreign Language II /ILV / Course no.: SPR.2 / 2nd semester / ECTS: 5</u></p> <p>Blended Learning</p>
<p>Evaluation Methods Criteria</p>	<p><u>Foreign Language II /ILV / Course no.: SPR.2 / 2nd semester / ECTS: 5</u></p> <p>Language examination</p>

Module number:	Regenerative energy production	Scope:	
TEC.3		6	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	2nd semester		
Level	2nd semester: Consolidation		
Previous knowledge	2nd semester: Fundamentals of Energy Technology (TEC.1), Fundamentals of Electrical Engineering (TEC.2)		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Regenerative energy production /ILV / Course no.: TEC.3 / 2nd semester / ECTS: 6</u> <ul style="list-style-type: none"> <li>• Kaltschmitt, M., W. Streicher and A. Wiese, 2013. Erneuerbare Energien: Systemtechnik, Wirtschaftlichkeit, Umweltaspekte. 5th edition. Berlin, Heidelberg: Springer-Verlag</li> <li>• Weischet, W. and W. Endlicher, 2018. Einführung in die Allgemeine Klimatologie. 9th edition. Stuttgart: Gebrüder Borntraeger Verlagsbuchhandlung</li> <li>• Albers, K. J., 2018. Recknagel Sprenger Albers – Taschenbuch für Heizung + Klimatechnik. 79th edition. 2019/2020 edition. Munich: Deutscher Industrieverlag</li> <li>• Bilitewski, B., G. Härdtle, 2014. Abfallwirtschaft: Handbuch für Praxis und Lehre. 4th edition. Heidelberg: Springer-Verlag</li> <li>• Cord-Landwehr, K., 2013. Einführung in die Abfallwirtschaft. 4th edition. Wiesbaden: Vieweg+Teubner Verlag.</li> </ul>		
Skills acquisition	<u>Regenerative energy production /ILV / Course no.: TEC.3 / 2nd semester / ECTS: 6</u> <p>The students are able to:</p> <ul style="list-style-type: none"> <li>• Describe the resource situation of renewable energies and secondary energy sources with regard to their location and with regard to the resource situation of renewable energies and secondary energy sources in terms of their location and their temporal occurrence and present options of waste and waste water utilization</li> <li>• Describe technologies and procedures for the utilization of renewable heat and electricity as well as naming individual processes and presenting characteristic values</li> <li>• Describe technologies and procedures for the utilization of energy storage as well as naming individual processes and presenting characteristic values</li> <li>• Describe aspects of sustainability and environmental compatibility of the individual generation and storage options</li> <li>• Discuss requirements for the system integration of renewable energies into the general energy supply</li> <li>• Name legal aspects for the utilization of renewable resources as well as the utilization of waste and waste water</li> </ul>		

<p>Course contents</p>	<p><u>Regenerative energy production /ILV / Course no.: TEC.3 / 2nd semester / ECTS: 6</u></p> <ul style="list-style-type: none"> <li>• Global and national energy demand / energy mix</li> <li>• Energy conversion chain and energy balance</li> <li>• Historical development of primary and secondary energy sources as well as their promotion, storage and use</li> <li>• Definition and interpretation of the basic terms used to describe renewable energy sources</li> <li>• Methods for determining the resource situation and problems of volatile renewable energy resources</li> <li>• Legal aspects of the use of renewable resources including laws and regulations relating to waste and wastewater management</li> <li>• Procedures for waste treatment and recycling as well as construction of a wastewater treatment plant with mechanical, biological and chemical-physical cleaning steps</li> <li>- Structure, functioning and characteristic values of energy generation plants:             <ul style="list-style-type: none"> <li>o thermal solar plants</li> <li>o heat pumps</li> <li>o energetic use of biomass</li> <li>o energetic use of waste and use of biogas, landfill gas and hydrogen</li> <li>o photovoltaics</li> <li>o hydropower plants</li> <li>o wind power plants</li> <li>o deep geothermal and geothermal power generation</li> <li>o solar thermal power generation</li> <li>o selected innovative renewable energy generation options currently under research</li> </ul> </li> <li>• development, functionality and storage duration of energy storage systems and energy conversion             <ul style="list-style-type: none"> <li>o chemical (inorganic and organic)</li> <li>o thermal</li> <li>o mechanical (kinetic and potential)</li> <li>o electrical</li> </ul> </li> <li>• aspects of sustainability in terms of efficiency, environmental impact and CO2 reduction of energy generation plants</li> </ul> <p>The module is made up of 50% exercises. This form of teaching takes place in small groups.</p>
<p>Teaching and learning methods</p>	<p><u>Regenerative energy production /ILV / Course no.: TEC.3 / 2nd semester / ECTS: 6</u></p> <p>Blended Learning</p>
<p>Evaluation Methods Criteria</p>	<p><u>Regenerative energy production /ILV / Course no.: TEC.3 / 2nd semester / ECTS: 6</u></p> <p>Written exam</p>

Module number:	Selected Topics Business Administration	Scope:	
ECO.3		8	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	3rd semester		
Level	3rd semester: Introduction and consolidation		
Previous knowledge	3rd semester: Introduction to Business Administration and Economics (ECO.1)		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<p><u>Selected Topics Business Administration /ILV / Course no.: ECO.3 / 3rd semester / ECTS: 8</u></p> <p>A generally valid description of the course content for the semester abroad cannot and should not be defined due to the large number of partner universities and the choices they offer, in order to guarantee freedom for students. Depending on the course content of the semester abroad at the partner universities, correspondingly adapted specialist literature is required.</p> <p>As an example, this module is based on the following specialist literature:</p> <ul style="list-style-type: none"> <li>• Kollmann, T., 2016. E-Entrepreneurship: Grundlagen der Unternehmensgründung in der digitalen Wirtschaft. Wiesbaden: Springer Gabler.</li> <li>• Osterwalder, A. and Y. Pigneur, 2011. Business Model Generation: Ein Handbuch für Visionäre, Spielveränderer und Herausforderer. Frankfurt a.M.: Campus Verlag GmbH.</li> <li>• Plümer, T. and M. Niemann, 2016. Existenzgründung Schritt für Schritt. 2nd edition. Wiesbaden: Springer Gabler.</li> </ul>		
Skills acquisition	<p><u>Selected Topics Business Administration /ILV / Course no.: ECO.3 / 3rd semester / ECTS: 8</u></p> <p>A generally valid description of the acquired competences for the semester abroad cannot and should not be defined due to the large number of partner universities and the choices they offer, in order to guarantee freedom for students. The learning outcomes are based on the fundamentals and in-depth knowledge of the individual disciplines in the energy industry. The national credits are converted individually into ECTS points corresponding to performance where appropriate.</p> <p>As an example, the students have acquired the following competences:</p> <p>The students are able to:</p> <ul style="list-style-type: none"> <li>• Explain the fundamentals of setting up a company</li> <li>• Apply the business plan creation process</li> <li>• Evaluate business plans</li> <li>• Explain economic trends and correlations or changes and assess the resulting new business models</li> <li>• Market a business model</li> </ul>		
Course contents	<p><u>Selected Topics Business Administration /ILV / Course no.: ECO.3 / 3rd semester / ECTS: 8</u></p> <p>A generally valid description of the course content for the semester abroad cannot and should not be defined due to the large number of partner universities and the choices they offer, in order to guarantee freedom for students. The learning contents are based on the fundamentals and in-depth knowledge of the individual disciplines in the field of business administration.</p> <p>As an example, this module has the following course contents:</p> <ul style="list-style-type: none"> <li>• Fundamentals of a company with a focus on digital business models</li> <li>• Components of a business plan and creation of a personal business plan</li> <li>• Business model analysis</li> <li>• Fundamentals of marketing business models</li> </ul>		
Teaching and learning methods	<p><u>Selected Topics Business Administration /ILV / Course no.: ECO.3 / 3rd semester / ECTS: 8</u></p> <p>The respective partner university determines the teaching methods.</p>		
Evaluation Methods Criteria	<p><u>Selected Topics Business Administration /ILV / Course no.: ECO.3 / 3rd semester / ECTS: 8</u></p> <p>Students are subject to the respective examination modalities of the partner university.</p>		

Module number:	Selected Topics Social skills and Presentation	Scope:	
SOC.1		7	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	3rd semester		
Level	3rd semester: Introduction		
Previous knowledge	3rd semester: basic knowledge of the use of presentation software		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<p><u>Selected Topics Social Skills &amp; Presentation /ILV / Course no.: SOC.1 / 3rd semester</u></p> <p>A generally valid description of the course content for the semester abroad cannot and should not be defined due to the large number of partner universities and the choices they offer, in order to guarantee freedom for students. Depending on the course content of the semester abroad at the partner universities, correspondingly adapted specialist literature is required.</p> <p>As an example, this module is based on the following specialist literature:</p> <ul style="list-style-type: none"> <li>• Rosenberg, M., 2012. Gewaltfreie Kommunikation. Paderborn: Junfermann</li> <li>• Becker, H. and A. Hugo-Becker, 1992. Psychologisches Konfliktmanagement. Munich: Beck.</li> <li>• Oboth, M., 2008. Mediation in Teams und Gruppen. Paderborn: Junfermann</li> </ul>		
Skills acquisition	<p><u>Selected Topics Social Skills &amp; Presentation /ILV / Course no.: SOC.1 / 3rd semester</u></p> <p>A generally valid description of the acquired competences for the semester abroad cannot and should not be defined due to the large number of partner universities and the choices they offer, in order to guarantee freedom for students. The learning outcomes are based on the fundamentals and in-depth knowledge of the individual disciplines in the area of social skills. The national credits are converted individually into ECTS points corresponding to performance where appropriate.</p> <p>As an example, the students have acquired the following competences:</p> <p>The students are able to:</p> <ul style="list-style-type: none"> <li>• Present basic concepts of communicative processes and consciously use content and relationship aspects of human communication.</li> <li>• Understand motivation and assessment of people in a professional context</li> <li>• Reflect a meaningful design of work and leisure time (work-life balance)</li> <li>• Facilitate communicative processes within the team and identify and analyze problems in team communication and develop solution strategies.</li> <li>• Prepare and conduct presentations and use the techniques and media required for them in a targeted manner</li> <li>• Create simple 3D visualizations</li> <li>• Create short videos to visualize ideas and concepts with simple tools</li> </ul>		

<p>Course contents</p>	<p><u>Selected Topics Social Skills &amp; Presentation /ILV / Course no.: SOC.1 / 3rd semester</u></p> <p>A generally valid description of the course content for the semester abroad cannot and should not be defined due to the large number of partner universities and the choices they offer, in order to guarantee freedom for students. The learning contents are based on the fundamentals and in-depth knowledge of the individual disciplines in the area of social skills.</p> <p>As an example, this module has the following course contents:</p> <ul style="list-style-type: none"> <li>• Basic components of communicative processes, message and meaning as well as content and relationship aspects of human communication</li> <li>• Language, gestures, facial expressions, posture</li> <li>• Possibilities of communication for assessment and motivation</li> <li>• Communication in a team</li> <li>• Communication problems and conflict solutions</li> <li>• Goals and target group as well as structure, content and form of a presentation</li> <li>• Selection and application of different presentation techniques and media</li> <li>• Challenges of dislocated presentations</li> <li>• Goals and target group as well as content and form of 3D visualizations</li> <li>• Selection and application of tools for the creation of 3D visualizations</li> <li>• Objectives and target group as well as structure, content and form of short videos</li> <li>• Selection and application of simple techniques and tools for video creation</li> </ul>
<p>Teaching and learning methods</p>	<p><u>Selected Topics Social Skills &amp; Presentation /ILV / Course no.: SOC.1 / 3rd semester</u></p> <p>The respective partner university determines the teaching methods.</p>
<p>Evaluation Methods Criteria</p>	<p><u>Selected Topics Social Skills &amp; Presentation /ILV / Course no.: SOC.1 / 3rd semester</u></p> <p>Students are subject to the respective examination modalities of the partner university.</p>

Module number:	Selected Topics Economics	Scope:	
VWL		10	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	3rd semester		
Level	3rd semester: Introduction and consolidation		
Previous knowledge	3rd semester: Introduction to Business Administration and Economics (ECO.1)		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<p><u>Selected Topics Economics /ILV / Course no.: VWL / 3rd semester / ECTS: 10</u></p> <p>A generally valid description of the course content for the semester abroad cannot and should not be defined due to the large number of partner universities and the choices they offer, in order to guarantee freedom for students. Depending on the course content of the semester abroad at the partner universities, correspondingly adapted specialist literature is required.</p> <p>As an example, this module is based on the following specialist literature:</p> <ul style="list-style-type: none"> <li>• Krugman, P., R., Wells, 2017. Volkswirtschaftslehre. 2nd edition. Munich: Schäffer Poeschel</li> <li>• Pirounakis, N., 2013. Real Estate Economics: A Point-to-Point Handbook. UK: Routledge.</li> <li>• Maier, G., F., Tödting, 2012. Regional- und Stadtökonomik 1: Standorttheorie und Raumstruktur. 5th edition. Vienna: Springer</li> <li>• Maier, G., F., Tödting, 2012. Regionalentwicklung und Regionalpolitik. 4th edition. Vienna: Springer</li> <li>• Rottke, N., M., Voigtländer, 2017. Immobilienwirtschaftslehre – Ökonomie. Wiesbaden: Gabler Verlag</li> </ul>		
Skills acquisition	<p><u>Selected Topics Economics /ILV / Course no.: VWL / 3rd semester / ECTS: 10</u></p> <p>A generally valid description of the acquired competences for the semester abroad cannot and should not be defined due to the large number of partner universities and the choices they offer, in order to guarantee freedom for students. The learning outcomes are based on the fundamentals and in-depth knowledge of the individual disciplines in the field of economics. The national credits are converted individually into ECTS points corresponding to performance where appropriate.</p> <p>As an example, the students have acquired the following competences:</p> <p>The students are able to:</p> <ul style="list-style-type: none"> <li>• Describe and apply basic concepts and methods in economics</li> <li>• Critically evaluate and question methods and concepts in economics</li> <li>• Recognize and understand economic interrelations in the context of the energy industry and sustainability management</li> </ul>		

<p>Course contents</p>	<p><u>Selected Topics Economics /ILV / Course no.: VWL / 3rd semester / ECTS: 10</u></p> <p>A generally valid description of the course content for the semester abroad cannot and should not be defined due to the large number of partner universities and the choices they offer, in order to guarantee freedom for students. The learning contents are based on the fundamentals and in-depth knowledge of the individual disciplines in the field of economics.</p> <p>As an example, this module has the following course contents:</p> <ul style="list-style-type: none"> <li>• Economic theory</li> <li>• Microeconomics</li> <li>• Macroeconomics</li> <li>• Econometrics</li> <li>• Regional economics</li> <li>• Economics of the energy industry</li> <li>• Sustainable management and sustainability strategies in the economic context</li> <li>• Closed-loop economy</li> <li>• Economic policy</li> <li>• Environmental economics</li> </ul>
<p>Teaching and learning methods</p>	<p><u>Selected Topics Economics /ILV / Course no.: VWL / 3rd semester / ECTS: 10</u></p> <p>The respective partner university determines the teaching methods.</p>
<p>Evaluation Methods Criteria</p>	<p><u>Selected Topics Economics /ILV / Course no.: VWL / 3rd semester / ECTS: 10</u></p> <p>Students are subject to the respective examination modalities of the partner university.</p>



Module number:	Selected Topics on Scientific and Empirical Methods	Scope:	
WIS.2		5	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	3rd semester		
Level	3rd semester: Introduction and consolidation		
Previous knowledge	3rd semester: Scientific and Empirical Methods (WIS.1)		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<p><u>Selected Topics on Scientific &amp; Empirical Methods /ILV / Course no.: WIS.2 / 3.</u></p> <p>A generally valid description of the course content for the semester abroad cannot and should not be defined due to the large number of partner universities and the choices they offer, in order to guarantee freedom for students. Depending on the course content of the semester abroad at the partner universities, correspondingly adapted specialist literature is required.</p> <p>As an example, this module is based on the following specialist literature:</p> <ul style="list-style-type: none"> <li>• Bortz, J. and N. Döring, 2006. Forschungsmethoden und Evaluation. Berlin: Springer</li> <li>• Flick, U., E. Kardorff and I. Steinke, 2007. Qualitative Forschung. Rowohlt's Enzyklopädie</li> <li>• Lamnek, S., 2010. Qualitative Sozialforschung. Berlin: Beltz</li> <li>• Przyborski, A. and M. Wohlrab-Sahr, 2010: Qualitative Sozialforschung. Munich: Oldenbourg</li> </ul>		
Skills acquisition	<p><u>Selected Topics on Scientific &amp; Empirical Methods /ILV / Course no.: WIS.2 / 3.</u></p> <p>A generally valid description of the acquired competences for the semester abroad cannot and should not be defined due to the large number of partner universities and the choices they offer, in order to guarantee freedom for students. The learning outcomes are based on the fundamentals and in-depth knowledge of the individual disciplines in the field of scientific and empirical methods. The national credits are converted individually into ECTS points corresponding to performance where appropriate.</p> <p>As an example, the students have acquired the following competences:</p> <p>The students are able to:</p> <ul style="list-style-type: none"> <li>• Describe and apply relevant quantitative and qualitative scientific methods in the subject area</li> <li>• Display and independently apply tools and methods to support data collection and analysis.</li> <li>• Illustrate and critically reflect on results in a comprehensible way</li> </ul>		

<p>Course contents</p>	<p><u>Selected Topics on Scientific &amp; Empirical Methods /ILV / Course no.: WIS.2 / 3.</u></p> <p>Due to the large number of partner universities and the choice of scientific and empirical methods they offer, a generally valid description of the course content for the semester abroad cannot and should not be defined in order to guarantee students freedom of choice. The content of the courses is oriented towards the fundamentals and in-depth knowledge of the individual disciplines in the field of scientific and empirical methods.</p> <p>As an example, this module has the following course contents:</p> <ul style="list-style-type: none"> <li>• Qualitative and quantitative scientific methods:             <ul style="list-style-type: none"> <li>o Questionnaire</li> <li>o Interview</li> <li>o Qualitative and quantitative content analysis</li> <li>o Field and laboratory study (focus experiment, A/B test and simulation)</li> </ul> </li> <li>• Tools and examples:             <ul style="list-style-type: none"> <li>o Data collection</li> <li>o Data analysis</li> <li>o Visualization of results</li> </ul> </li> <li>• Description and critical reflection of results</li> </ul>
<p>Teaching and learning methods</p>	<p><u>Selected Topics on Scientific &amp; Empirical Methods /ILV / Course no.: WIS.2 / 3.</u></p> <p>The respective partner university determines the teaching methods.</p>
<p>Evaluation Methods Criteria</p>	<p><u>Selected Topics on Scientific &amp; Empirical Methods /ILV / Course no.: WIS.2 / 3.</u></p> <p>Students are subject to the respective examination modalities of the partner university.</p>

<b>Module number:</b>	<b>Energy Markets</b>	<b>Scope:</b>	
<b>EMI</b>		<b>4</b>	<b>ECTS</b>
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	4th semester		
Level	4th semester: Consolidation		
Previous knowledge	4th semester: Fundamentals of Energy & Sustainability Management (ENM), Introduction to Business Administration and Economics (ECO.1)		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Energy markets /ILV / Course no.: EMI / 4th semester / ECTS: 4</u> <ul style="list-style-type: none"> <li>• Stern, J., 2011. The Transition to Hub-Based Gas Pricing in Continental Europe. Oxford Institute of Energy Studies</li> <li>• Ströbele, W., Pfaffenberger, W., Heuterkes, M., 2012. Energiewirtschaft: Einführung in Theorie und Politik. Oldenbourg: Wissenschaftsverlag</li> <li>• Zenke, I., et al., 2017. Energiehandel in Europa: Öl, Gas, Strom, Derivate, Zertifikate. 4th edition. Munich: C.H.Beck Verlag</li> </ul>		
Skills acquisition	<u>Energy markets /ILV / Course no.: EMI / 4th semester / ECTS: 4</u> <p>The students are able to:</p> <ul style="list-style-type: none"> <li>• Explain the principles of commodity futures trading and freely traded energy markets</li> <li>• Present and explain price formation in the energy market</li> <li>• Present fundamental factors influencing the trading prices of energy sources</li> <li>• Understand the status of the European and national energy markets with regard to political development goals</li> <li>• Describe the trading cascade in the electricity and gas market</li> <li>• Describe mechanisms of certificate trading</li> <li>• Differentiate between the Clean Dark and Clean Spark Spread</li> </ul>		
Course contents	<u>Energy markets /ILV / Course no.: EMI / 4th semester / ECTS: 4</u> <ul style="list-style-type: none"> <li>• Unbundling of natural monopolies and free energy markets</li> <li>• European and national development of the electricity and gas industry</li> <li>• Energy pricing and influencing factors</li> <li>• Standardized exchange products and trading markets</li> <li>• Comparison of different approaches for energy services, balancing energy services and capacity services</li> <li>• Merit - Order</li> <li>• Trading cascade</li> <li>• Markets for renewable energy sources</li> <li>• Certificate trading</li> <li>• Clean Dark Spread, Clean Spark Spread</li> </ul>		
Teaching and learning methods	<u>Energy markets /ILV / Course no.: EMI / 4th semester / ECTS: 4</u> Blended Learning		
Evaluation Methods Criteria	<u>Energy markets /ILV / Course no.: EMI / 4th semester / ECTS: 4</u> Written exam		

Module number:	Innovative Mobility Concepts	Scope:	
IMK		6	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	4th semester		
Level	4th semester: Introduction		
Previous knowledge	4th semester: Basics Energy & Sustainability Management (ENM), Renewable Energy Production (TEC.3)		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Innovative mobility concepts /ILV / Course no.: IMK / 4th semester / ECTS: 6</u> <ul style="list-style-type: none"> <li>• Hunecke, M., 2015. Mobilitätsverhalten verstehen und verändern. Munich: Springer Fachmedien</li> <li>• Lienkamp, M., et al., 2013. Energieeffiziente Antriebstechnologien - Hybridisierung - Downsizing- Software und IT. Wiesbaden: Springer Vieweg</li> <li>• Maurer M., Gerdes, C., Lenz, B., Winner, H., 2015. Autonomes Fahren - Technische, rechtliche und gesellschaftliche Aspekte. Wiesbaden: Springer Vieweg</li> <li>• Wagner, H., Kabel, S., 2018. Mobilität 4.0 - neue Geschäftsmodelle für Produkt- und Dienstleistungsinnovationen. Heidelberg: Springer Gabler</li> </ul>		
Skills acquisition	<u>Innovative mobility concepts /ILV / Course no.: IMK / 4th semester / ECTS: 6</u> <p>The students are able to:</p> <ul style="list-style-type: none"> <li>• Understand mobility behavior and describe different user groups</li> <li>• Describe cause-and-effect relationships between mobility and ecology and present mobility-relevant types of emissions from different mobility concepts</li> <li>• Present the effects of mobility concepts in relation to urban planning parameters</li> <li>• Alternative drive technologies including describing the effects of mobility concepts with regard to urban development parameters</li> <li>• Describe alternative drive technologies including a possible storage facility and filling station network and specify sustainability aspects</li> <li>• Discuss options for integrating automated and autonomous driving in innovative mobility concepts</li> <li>• Discuss strategies for avoiding mobility</li> <li>• Name and discuss exemplary concepts of local public transport for urban and rural areas</li> <li>• Describe legal and technical requirements for the use of regeneratively generated electricity in the mobility sector in companies as well as in private buildings, housing estates, social and non-profit housing</li> <li>• Analyze mobility concepts with regard to their sustainability</li> </ul>		
Course contents	<u>Innovative mobility concepts /ILV / Course no.: IMK / 4th semester / ECTS: 6</u> <ul style="list-style-type: none"> <li>• Mobility behavior and user groups</li> <li>• Mobility-relevant emission types (greenhouse gases, air pollutants and noise)</li> <li>• Land requirements for mobility</li> <li>• Alternative drive technologies</li> <li>• Storage and filling station network</li> <li>• Opportunities and risks of automated and autonomous driving</li> <li>• Mobility as a service</li> <li>• Strategies for mobility avoidance</li> <li>• Public transport concepts for urban and rural areas</li> <li>• Legal and technical requirements for the use of regeneratively generated electricity in the mobility sector in companies and in residential buildings</li> <li>• Economic efficiency of mobility concepts</li> <li>• Current trends in interdisciplinary mobility research</li> </ul> <p>The module is made up of 50% exercises. This form of teaching takes place in small groups.</p>		
Teaching and learning methods	<u>Innovative mobility concepts /ILV / Course no.: IMK / 4th semester / ECTS: 6</u> Blended Learning		
Evaluation Methods Criteria	<u>Innovative mobility concepts /ILV / Course no.: IMK / 4th semester / ECTS: 6</u> Seminar thesis		

Module number:	Practical Project I	Scope:	
PRX.1		6	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	4th semester		
Level	4th semester: Introduction and consolidation		
Previous knowledge	4th semester: all contents of the modules from semesters 1, 2 and 3.		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Practical Project I /ILV / Course no.: PRX.1 / 4th semester / ECTS: 6</u> <ul style="list-style-type: none"> <li>• Patzak, G., Rattay and G., 2014. Project management: Leitfaden zum Management von Projekten, Projektportfolios und projektorientierten Unternehmen. Vienna: Linde.</li> <li>• PMI Institute, 2009. A Guide to the Project Management Body of Knowledge (PMBOK)</li> <li>• Kraus, G. and R. Westermann, 2004. Projektmanagement mit System: Organisation, Methoden, Steuerung. Wiesbaden: Springer-Gabler</li> </ul>		
Skills acquisition	<u>Practical Project I /ILV / Course no.: PRX.1 / 4th semester / ECTS: 6</u> <p>The students are able to:</p> <ul style="list-style-type: none"> <li>• Independently identify problems and tasks from a given objective</li> <li>• Collect and analyze data independently</li> <li>• Independently develop solutions and present results</li> <li>• Independently acquire specialist knowledge for solving specific problems and implement this knowledge in line with the situation</li> <li>• Name project management methods and apply the structures and processes of a defined project independently using supporting project management tools.</li> <li>• Communicate in a situation-appropriate and personal manner</li> </ul>		
Course contents	<u>Practical Project I /ILV / Course no.: PRX.1 / 4th semester / ECTS: 6</u> <p>Students must carry out a project in small groups of 4 ECTS = 100h. The basis for this is a set objective. The students are responsible for planning, coordination, budgeting, monitoring, communication and reporting as well as finding solutions. The role of the course leader is focused on coaching the students.</p> <p>In addition to the project, the following teaching and learning contents are part of this module:</p> <ul style="list-style-type: none"> <li>• Basic principles of project management and application of supporting tools</li> <li>• Project planning (project organization, resource planning with time planning as well as cost, finance and budget planning)</li> <li>• Project management (time management, cost monitoring and accounting, team leadership, quality management for projects)</li> </ul>		
Teaching and learning methods	<u>Practical Project I /ILV / Course no.: PRX.1 / 4th semester / ECTS: 6</u> <p>Blended learning &amp; problem-based and project-based learning</p>		
Evaluation Methods Criteria	<u>Practical Project I /ILV / Course no.: PRX.1 / 4th semester / ECTS: 6</u> <p>Project and portfolio</p>		

Module number:	Regional energy concepts	Scope:	
TEC.4		5	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	4th semester		
Level	4th semester: Introduction		
Previous knowledge	4th semester: Fundamentals of Energy & Sustainability Management (ENM), Fundamentals of Energy Technology (TEC.1), Renewable Energy Production (TEC.3)		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Regional energy concepts /ILV / Course no.: TEC.4 / 4th semester / ECTS: 5</u> <ul style="list-style-type: none"> <li>• Erhorn-Kluttig, H., et al., 2011. Energetische Quartiersplanung Methoden - Technologien - Praxisbeispiele. Fraunhofer IRB Verlag</li> <li>• Stockinger, V., 2015. Energie+-Siedlungen und -Quartiere. Definition, Planung, Betrieb, Nutzung, Bilanzierung und Bewertung. Stuttgart: Fraunhofer IRB Verlag</li> <li>• Drittenpreis, J., Schmid, T. and Zadow, O., 2013. Energienutzungsplan unter besonderer Berücksichtigung des Denkmalschutzes am Beispiel der Stadt Iphofen. Stuttgart: Fraunhofer IRB Verlag</li> <li>• Hehn, N., 2015. Postfossile Stadtentwicklung. Weimar: Metropolis</li> </ul>		
Skills acquisition	<u>Regional energy concepts /ILV / Course no.: TEC.4 / 4th semester / ECTS: 5</u> <p>The students are able to:</p> <ul style="list-style-type: none"> <li>• Describe legal aspects of regional energy concepts</li> <li>• Present participatory approaches and stakeholder involvement</li> <li>• Identify and apply methods for inventory and potential analysis</li> <li>• Analyze and create concepts and catalogs of measures for regional energy concepts</li> <li>• Identify and analyze organizational structures for the implementation of regional energy concepts</li> </ul>		
Course contents	<u>Regional energy concepts /ILV / Course no.: TEC.4 / 4th semester / ECTS: 5</u> <p>Regional Energy Master Plan:</p> <ul style="list-style-type: none"> <li>• legal basics</li> <li>• participation of stakeholders and process of a regional energy master plan</li> <li>• methods for stock and potential analysis (consumption, infrastructure, resources)</li> <li>• methods for concept development and preparation of a catalogue of measures</li> <li>• organizational structures for implementation</li> <li>• analysis of implementation examples</li> </ul>		
Teaching and learning methods	<u>Regional energy concepts /ILV / Course no.: TEC.4 / 4th semester / ECTS: 5</u> <p>Blended Learning</p>		
Evaluation Methods Criteria	<u>Regional energy concepts /ILV / Course no.: TEC.4 / 4th semester / ECTS: 5</u> <p>Project</p>		

Module number:	Smart energy systems	Scope:	
TEC.5		9	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	4th semester		
Level	4th semester: Consolidation		
Previous knowledge	4th semester: Fundamentals of Energy Technology (TEC.1), Renewable Energy Production (TEC.3)		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<p><u>Smart energy systems /ILV / Course no.: TEC.5 / 4th semester / ECTS: 9</u></p> <ul style="list-style-type: none"> <li>• Buchholz, B., Stycynski, Z., 2018. Smart Grids: Grundlagen und Technologien der elektrischen Netze der Zukunft. Berlin: VDE Verlag</li> <li>• Flosdorff, R. and G. Hilgarth, 2017. Elektrische Energieverteilung. 10th edition. Wiesbaden: Vieweg+Teubner Verlag</li> <li>• Sillaber, A., 2016. Leitfaden zur Verteilnetzplanung und Systemgestaltung - Entwicklung dezentraler Elektrizitätssysteme. Wiesbaden: Springer Vieweg</li> <li>• Behrens, W., et al., 2009. Technisches Handbuch Fernwärme. 2nd edition. AGFW-Projektgesellschaft für Rationalisierung</li> <li>• Dötsch, C., Taschenberger, J., Schönberg, I., 1998. Leitfaden Nahwärme - Band 6. Oberhausen: Fraunhofer Umsicht</li> <li>• Muchna, C., et al., 2017. Grundlagen der Logistik: Begriffe, Strukturen und Prozesse. Wiesbaden: Springer Gabler</li> </ul>		
Skills acquisition	<p><u>Smart energy systems /ILV / Course no.: TEC.5 / 4th semester / ECTS: 9</u></p> <p>The students are able to:</p> <ul style="list-style-type: none"> <li>• Understand the basics of network planning, maintenance and operation of electricity and heating/cooling networks</li> <li>• Identify technical, economic and legal aspects of feed-in, transmission and consumption in electricity and heating/cooling networks</li> <li>• Present technical, economic and legal options for the logistics of primary and secondary energy sources</li> <li>• Discuss current development trends of electricity and heating/cooling networks and the logistics of energy sources and classify them with regard to their impact</li> </ul>		
Course contents	<p><u>Smart energy systems /ILV / Course no.: TEC.5 / 4th semester / ECTS: 9</u></p> <p>Smart Grids - electricity networks:</p> <ul style="list-style-type: none"> <li>• Technical, economic and legal aspects of transmission and distribution of electrical energy (overhead line, cable)</li> <li>• Tasks of network operators and the function of network regulation (incentive regulation)</li> <li>• Basic principles of network planning, network maintenance and network operation</li> <li>• Effects of feed-in and consumption on network operation in the transmission and distribution network</li> <li>• Network access and network use</li> <li>• Current trends in electrical supply networks</li> </ul> <p>heating/cooling networks:</p> <ul style="list-style-type: none"> <li>• Technical, economic and legal aspects of the transmission and distribution of heat and cold (district and local heating/cooling networks, MicroGrids)</li> <li>• Basic principles of network planning, maintenance and operation including merit order</li> <li>• Current trends in heating and cooling networks</li> </ul> <p>Logistics of energy sources:</p> <ul style="list-style-type: none"> <li>• Technical, economic and legal aspects of logistics of primary and secondary energy sources</li> <li>• Basic principles of logistics planning</li> <li>• Tasks of logistics companies and energy suppliers</li> <li>• Current trends in logistics of energy sources</li> </ul>		
Teaching and learning methods	<p><u>Smart energy systems /ILV / Course no.: TEC.5 / 4th semester / ECTS: 9</u></p> <p>Blended Learning</p>		
Evaluation Methods Criteria	<p><u>Smart energy systems /ILV / Course no.: TEC.5 / 4th semester / ECTS: 9</u></p> <p>Examination and portfolio</p>		

Module number:	Energy & Sustainability Audit	Scope:	
AUD.1		7	ECTS
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	5th semester		
Level	5th semester: Introduction and consolidation		
Previous knowledge	5th semester: Fundamentals of Energy & Sustainability Management (ENM), Introduction to Business Administration and Economics (ECO.1)		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Energy &amp; Sustainability Audit /ILV / Course no.: AUD.1 / 5th semester / ECTS: 7</u> <ul style="list-style-type: none"> <li>• Lenitz, M., 2018. Managementsysteme richtig auditieren: Die Anwendung der ÖNORM EN ISO 19011:2018 in der Praxis. Vienna: Austrian Standards plus</li> <li>• Weigl, C., 2018. Praxishandbuch DIN ISO 45001 - inkl. Arbeitshilfen online: Arbeits- und Gesundheitsschutz in Organisationen umsetzen und managen. Freiburg: Haufe Fachbuch</li> <li>• Brauweiler, J., et al., 2018. Umweltmanagementsysteme nach ISO 14001: Grundwissen für Praktiker (essentials). Berlin: Springer Gabler</li> <li>• Förtsch, G., Meinholz, H., 2018. Handbuch Betriebliches Umweltmanagement. Wiesbaden: Springer Vieweg</li> <li>• Engelfried, J., 2016. Nachhaltiges Umweltmanagement - Schritt für Schritt: Arbeitsbuch. Stuttgart: utb</li> <li>• Fifka, M., 2014. CSR und Reporting. Berlin: Springer Gabler</li> <li>• Wunder, T., 2019, Rethinking Strategic Management: Sustainable Strategizing for Positive Impact (CSR, Sustainability, Ethics &amp; Governance). Heidelberg: Springer</li> </ul>		
Skills acquisition	<u>Energy &amp; Sustainability Audit /ILV / Course no.: AUD.1 / 5th semester / ECTS: 7</u> <p>The students are able to:</p> <ul style="list-style-type: none"> <li>• Present the basics of Energy &amp; Sustainability Auditing and monitoring</li> <li>• Name calculation methods and characteristic values for life cycle analyses and to carry out exemplary calculations themselves</li> <li>• Describe and analyze auditing processes including the use of standards and regulations for selected examples of auditing building efficiency, industrial processes and mobility / transport (traffic)</li> <li>• Describe aspects of process modelling in the context of Energy &amp; Sustainability Audits</li> <li>• Present aspects of Corporate Social &amp; Sustainable Responsibility (CSR)</li> <li>• Designate the tasks of an auditor</li> </ul>		
Course contents	<u>Energy &amp; Sustainability Audit /ILV / Course no.: AUD.1 / 5th semester / ECTS: 7</u> <ul style="list-style-type: none"> <li>• Audits for static and dynamic quality management</li> <li>• Auditing of management systems (ISO 19011)</li> <li>• Energy &amp; Sustainability Auditing process and monitoring (ISO 14001)</li> <li>• Occupational health and safety (ISO 45001)</li> <li>• Calculation methods and indicators for life cycle analysis</li> <li>• Introduction to process modelling</li> <li>• Corporate Social and Sustainable Responsibility (CSR) reporting</li> <li>• Tasks of an Energy &amp; Sustainability Auditor</li> <li>• Analysis of examples of Energy &amp; Sustainability Auditing</li> </ul>		
Teaching and learning methods	<u>Energy &amp; Sustainability Audit /ILV / Course no.: AUD.1 / 5th semester / ECTS: 7</u> Blended Learning		
Evaluation Methods Criteria	<u>Energy &amp; Sustainability Audit /ILV / Course no.: AUD.1 / 5th semester / ECTS: 7</u> Written exam		



Module number:	Energy Audit	Scope:	
		10	ECTS
AUD.2			
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	5th semester		
Level	5th semester: Introduction and consolidation		
Previous knowledge	5th semester: Fundamentals of Energy Technology (TEC.1), Digitization in Energy & Sustainability Management (DIT), Renewable Energy Production (TEC.3), Regional Energy Concepts (TEC.4), Smart Energy Systems (TEC.5)		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Energy Audit (E) /ILV / Course no.: AUD.2 / 5th semester / ECTS: 10</u> <ul style="list-style-type: none"> <li>• Pistohl, W., Scheuerer, F. and Rechenauer, C., 2016. Handbuch der Gebäudetechnik: Volume 2: Heizung/Lüftung/Beleuchtung/Energiesparen. 9th edition. Cologne: Bundesanzeiger Verlag</li> <li>• Willems, W., et al., 2017. Lehrbuch der Bauphysik: Schall - Wärme - Feuchte - Licht - Brand - Klima. 8th edition. Wiesbaden: Springer Vieweg</li> <li>• Pöschk, J., 2016. Energieeffizienz in Gebäuden 2016: Jahrbuch. Berlin: v m e Verlag und Medienservice Energie</li> <li>• Lisson, M., Düroff, P., Kremer, J., 2014. Energieaudits in kleinen und mittleren Unternehmen. Kissing: Weka Media Verlag</li> <li>• Lösungen zur praktischen Umsetzung Textbeispiele, Musterformulare, Checklisten. Berlin: Beuth Praxis</li> <li>• Blesl M. and A. Kessler, 2013. Energieeffizienz in der Industrie. Berlin, Heidelberg: Springer Vieweg</li> <li>• Brugger-Gebhardt, S., Jungblut, G., 2019. Die DIN EN ISO 50001:2018 verstehen: Die Norm sicher interpretieren und sinnvoll umsetzen. Wiesbaden: Springer Gabler</li> </ul>		
Skills acquisition	<u>Energy Audit (E) /ILV / Course no.: AUD.2 / 5th semester / ECTS: 10</u> The students are able to: <ul style="list-style-type: none"> <li>• Name the most important aspects of an energetic building evaluation and apply them in exercises</li> <li>• Collect and evaluate data and facts on the efficient use of resources in the building sector and in small and medium-sized enterprises by means of a system-oriented approach</li> <li>• Describe elements of energy management and to name measures for implementation</li> <li>• Work in interdisciplinary, international teams</li> <li>• Reflect internationally on different approaches and possible solutions and to derive personal knowledge and expertise from this</li> </ul>		
Course contents	<u>Energy Audit (E) /ILV / Course no.: AUD.2 / 5th semester / ECTS: 10</u> <ul style="list-style-type: none"> <li>• Aspects of building physics and building and materials science as well as classification of the energy efficiency of building envelopes</li> <li>• Energy efficiency of technical building systems (heating, ventilation, air conditioning) as well as lighting and electricity consumption for appliances</li> <li>• Collection and analysis of energy data and measured values</li> <li>• Systematics of the energy performance certificate</li> <li>• Energy management (ISO 50001) and tasks of the energy auditor</li> </ul> <p>The module consists of a compact week (60%), during which the following course contents are worked on in small groups with international students:</p> <ul style="list-style-type: none"> <li>• Introduction, consolidation, background and examples in the complex of topics of the project within the framework of a conference or introductory event.</li> <li>• Research and analysis of framework conditions and possibilities</li> <li>• Development and visualization of ideas and concepts</li> <li>• Presentation of the results to stakeholders and/or technical experts</li> </ul>		
Teaching and learning methods	<u>Energy Audit (E) /ILV / Course no.: AUD.2 / 5th semester / ECTS: 10</u> Project and Problem Based Learning		
Evaluation Methods Criteria	<u>Energy Audit (E) /ILV / Course no.: AUD.2 / 5th semester / ECTS: 10</u> Project and presentation		

<b>Module number:</b>	<b>Investment &amp; Financing</b>	<b>Scope:</b>	
<b>ECO.4</b>		<b>4</b>	<b>ECTS</b>
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	5th semester		
Level	5th semester: Consolidation		
Previous knowledge	5th semester: Introduction to Business Administration and Economics (ECO.1)		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Investment &amp; Financing /ILV / Course no.: ECO.4 / 5th semester / ECTS: 4</u> <ul style="list-style-type: none"> <li>• Olfert, K., 2015. Investment. 13th edition Herne: Friedrich Kiehl Verlag</li> <li>• Däumler, K. D. and J. Grabe, 2014. Grundlagen der Investitions- und Wirtschaftlichkeitsrechnung. 13th edition Herne: NWB Verlag</li> <li>• Hack, M., 2015. Energy Contracting: Energiedienstleistungen und dezentrale Energieversorgung. 3rd edition. Munich: C.H. Beck Verlag</li> </ul>		
Skills acquisition	<u>Investment &amp; Financing /ILV / Course no.: ECO.4 / 5th semester / ECTS: 4</u> <p>The students are able to:</p> <ul style="list-style-type: none"> <li>• Name key business profitability figures</li> <li>• Discuss investment decisions in projects and other economic decision alternatives</li> <li>• Explain procedures of business valuation and options of contract design with different types of services between provider and customer</li> <li>• Name methods of carrying out economic evaluations</li> </ul>		
Course contents	<u>Investment &amp; Financing /ILV / Course no.: ECO.4 / 5th semester / ECTS: 4</u> <ul style="list-style-type: none"> <li>• Investment decision as a process in the entrepreneurial environment</li> <li>• Static and dynamic procedures of investment calculation</li> <li>• Profitability ratios of the profitability calculation</li> <li>• Case studies of investments in the generation and distribution grid sector as well as in sales and customer projects</li> <li>• Energy and environmental protection services from the supplier and customer point of view</li> <li>• Contract design of different service models</li> </ul>		
Teaching and learning methods	<u>Investment &amp; Financing /ILV / Course no.: ECO.4 / 5th semester / ECTS: 4</u> <p>Blended Learning</p>		
Evaluation Methods Criteria	<u>Investment &amp; Financing /ILV / Course no.: ECO.4 / 5th semester / ECTS: 4</u> <p>Written exam</p>		

Module number:	Practical Project II	Scope:	
		5	ECTS
PRX.2			
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	5th semester		
Level	5th semester: Consolidation		
Previous knowledge	5th semester: Practical project I (PRX.1) and all course content from the 4th semester		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Practical Project II /ILV / Course no.: PRX.2 / 5th semester / ECTS: 5</u> <ul style="list-style-type: none"> <li>• Zerfaß, A., et al., 2019. Toolbox Kommunikationsmanagement: Denkwerkzeuge und Methoden für die Steuerung der Unternehmenskommunikation. Wiesbaden: Springer Gabler</li> <li>• Aerssen, B., 2018. Das große Handbuch Innovation: 555 Methoden und Instrumente für mehr Kreativität und Innovation im Unternehmen. Munich: Vahlen</li> <li>• Lafrenière, D., 2019. Delivering Fantastic Customer Experience: How to Turn Customer Satisfaction Into Customer Relationships. Abingdon: Productivity Press</li> </ul>		
Skills acquisition	<u>Practical Project II /ILV / Course no.: PRX.2 / 5th semester / ECTS: 5</u> <p>The students are able to build on and expand their knowledge of the practical project I:</p> <ul style="list-style-type: none"> <li>• Independently identify problems and tasks from a given objective</li> <li>• Collect and analyze data independently</li> <li>• Independently develop solutions and present results</li> <li>• Identify, reflect and transfer examples and approaches from practice and research to solve specific problems</li> <li>• Independently develop expertise to solve specific problems</li> </ul>		
Course contents	<u>Practical Project II /ILV / Course no.: PRX.2 / 5th semester / ECTS: 5</u> <p>Students must carry out a project in small groups of 4 ECTS = 100h. The basis for this is a set objective. The students are responsible for planning, coordination, budgeting, monitoring, communication and reporting as well as finding solutions. The role of the course leader is focused on coaching the students.</p> <p>In addition to the project, the following teaching and learning contents are part of this module:</p> <ul style="list-style-type: none"> <li>• Examples and approaches from practice and research will be presented in lectures by experts as well as excursions to companies and research institutions.</li> </ul>		
Teaching and learning methods	<u>Practical Project II /ILV / Course no.: PRX.2 / 5th semester / ECTS: 5</u> <p>Presentation and problem-based and project-based learning</p>		
Evaluation Methods Criteria	<u>Practical Project II /ILV / Course no.: PRX.2 / 5th semester / ECTS: 5</u> <p>Project</p>		

<b>Module number:</b>	<b>Foreign Language III</b>	<b>Scope:</b>	
<b>SPR.3</b>		<b>4</b>	<b>ECTS</b>
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	5th semester		
Level	5th semester: Introduction or consolidation		
Previous knowledge	5th semester: French, Italian, Spanish Module with objective A2: no previous knowledge allowed Module with objective B2: Previous knowledge required Chinese, Russian Module with objective A2: no previous knowledge allowed English Module with objective B2: Level B1 (GER) or English advanced course required Module with objective C1: Level B2 (GER) required Module with objective C2: Level C1 (GER) required		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Foreign Language III /ILV / Course no.: SPR.3 / 5th semester / ECTS: 4</u> Course book - by arrangement; authentic materials, e.g. from English language journals (including specialist journals), newspapers and online media		

<p>Skills acquisition</p>	<p><u>Foreign Language III /ILV / Course no.: SPR.3 / 5th semester / ECTS: 4</u></p> <p>The Foreign Language I, II and III modules are designed according to the Common European Framework of Reference for Languages (CEFR). In the three modules, students will acquire the language skills and develop the skills necessary for a business-oriented professional or academic activity.</p> <p>According to the CEFR, the following competences are taught in the three consecutive Foreign Language I, II and III modules, depending on the language chosen and building on the students' existing prior knowledge:</p> <p><b>A1 - Beginners</b> The students are able to:</p> <ul style="list-style-type: none"> <li>• understand and use familiar, everyday expressions and very simple sentences aimed at satisfying specific needs</li> <li>• introduce themselves and others and ask other people questions about themselves</li> <li>• e.g. where they live, what kind of people they know or what things they have, and to answer questions of this kind</li> <li>• communicate in a simple way if the interlocutor speaks slowly and clearly and is prepared to help</li> </ul> <p><b>A2 - Basic knowledge</b> Students are able to:</p> <ul style="list-style-type: none"> <li>• understand sentences and frequently-used expressions related to areas of most immediate relevance (e.g. personal and family information, shopping, work, local area)</li> <li>• communicate in simple, routine situations involving a simple and direct exchange of information on familiar and routine matters</li> <li>• describe in simple terms their own background and education, immediate environment and matters relating to immediate needs</li> </ul> <p><b>B1 - Advanced Language Use</b> Students are able to:</p> <ul style="list-style-type: none"> <li>• understand the main points of clear standard language use and familiar matters related to work, school, leisure, etc.</li> <li>• cope with most situations encountered when traveling in the language area</li> <li>• express themselves in a simple and coherent way on familiar topics and areas of personal interest</li> <li>• report on experiences and events, describe dreams, hopes and ambitions and briefly give reasons or explanations for plans and opinions</li> </ul> <p><b>B2 - Use language independently</b> Students are able to:</p> <ul style="list-style-type: none"> <li>• understand the main content of complex texts on both specific and abstract topics, as well as technical discussions in their own field of specialization</li> <li>• be able to communicate so spontaneously and fluently that a normal conversation with native speakers is easily possible without much effort on either side</li> </ul>
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Skills acquisition	<ul style="list-style-type: none"><li>• express themselves clearly and in detail on a wide range of subjects, explain a viewpoint on a topical issue and indicate the advantages and disadvantages of various options</li></ul> <p>C1 - Proficient language skills Students are able to:</p> <ul style="list-style-type: none"><li>• understand a wide range of demanding, longer texts and also grasp implicit meanings</li><li>• express themselves spontaneously and fluently without having to search for words in a clearly recognizable way more often</li><li>• use the language effectively and flexibly in social and professional life or in training and studies</li><li>• express themselves clearly, in a structured and detailed manner on complex subjects, making appropriate use of various means of linking texts</li></ul> <p>C2 - Near-native speaker Students are able to:</p> <ul style="list-style-type: none"><li>• understand with ease virtually everything they read or hear</li><li>• summarize information from different written and oral sources, giving reasons and explanations in a coherent presentation</li><li>• express him/herself spontaneously, very fluently and precisely, and clarify finer shades of meaning even in more complex situations</li></ul>
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<p>Course contents</p>	<p><u>Foreign Language III /ILV / Course no.: SPR.3 / 5th semester / ECTS: 4</u></p> <p>The course content depends on the students' choice of language and the classification of their previous knowledge according to the CEFR:</p> <p>A1 - Beginners</p> <ul style="list-style-type: none"> <li>• understand and use familiar, everyday expressions and very simple sentences aimed at satisfying specific needs</li> <li>• introduce yourself and others and ask other people personal questions - e.g. where they live, what kind of people they know or what things they have - and answer questions of this kind - communicate in a simple way if the interlocutor speaks slowly and clearly and is willing to help</li> </ul> <p>A2 - Basic knowledge</p> <ul style="list-style-type: none"> <li>• understand sentences and frequently-used expressions related to areas of immediate relevance (e.g. information about the person and family, shopping, work, immediate surroundings)</li> <li>• communicate in simple, routine situations involving a simple and direct exchange of information on familiar and routine matters</li> <li>• describe in simple terms their own background and education, immediate environment and matters relating to immediate needs</li> </ul> <p>B1 - Advanced language use</p> <ul style="list-style-type: none"> <li>• use clear standard language and relate to familiar matters from work, school, leisure, etc. to communicate</li> <li>• use conversational skills relevant to travel in the language area</li> <li>• express themselves in a simple and coherent way on familiar topics and personal areas of interest</li> <li>• report on experiences and events, describe dreams, hopes and ambitions and give short justifications or explanations of plans and views</li> </ul> <p>B2 - Independent language use</p> <ul style="list-style-type: none"> <li>• express themselves on both specific and abstract topics with regard to the main content of complex texts; take part in specialist discussions in their own field of specialization</li> <li>• communicate so spontaneously and fluently that a normal conversation with native speakers is easily possible without much effort on either side</li> <li>• express themselves clearly and in detail on a wide range of topics, explain a viewpoint on a topical issue and state the advantages and disadvantages of various options</li> </ul> <p>C1 - Expert language skills</p> <ul style="list-style-type: none"> <li>• understand a wide range of more demanding, longer texts and also grasp implicit meanings</li> <li>• express themselves spontaneously and fluently without having to search for words more often in a clearly recognizable way</li> <li>• use the language effectively and flexibly in social and professional life or in training and studies</li> <li>• express themselves on complex issues in a clear, structured and detailed manner, making appropriate use of various means of linking texts</li> </ul> <p>C2 - Near-native speaker skills</p> <ul style="list-style-type: none"> <li>• Effortless communication in all language situations</li> <li>• Summarizing information from different written and oral sources, giving reasons and explanations in a coherent presentation</li> <li>• Expressing themselves spontaneously, very fluently and precisely, making finer shades of meaning clear even in more complex situations</li> </ul>
<p>Teaching and learning methods</p>	<p><u>Foreign Language III /ILV / Course no.: SPR.3 / 5th semester / ECTS: 4</u></p> <p>Blended Learning</p>
<p>Evaluation Methods Criteria</p>	<p><u>Foreign Language III /ILV / Course no.: SPR.3 / 5th semester / ECTS: 4</u></p> <p>Language examination</p>

Module number:	Internship	Scope:	
		20	ECTS
PRX.3			
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	6th semester		
Level	6th semester: Consolidation		
Previous knowledge	6th semester: all contents of modules with cross-links to the areas of responsibility of the professional internship from semesters 1 to 5.		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Internship /BPR / Course no.: PRX.3 / 6th semester / ECTS: 20</u> • Brenner, D., 2007. Schön, dass Sie da sind!: Karrierestart nach dem Studium. Nürnberg: BW Verlag		
Skills acquisition	<u>Internship /BPR / Course no.: PRX.3 / 6th semester / ECTS: 20</u>  The students are able to: <ul style="list-style-type: none"> <li>• Apply their acquired knowledge in professional practice</li> <li>• Understand processes in the professional environment</li> <li>• Solve problems independently within the scope of professional projects and implement solutions as well as justify them with comprehensible arguments and present results in a clear and target-oriented way</li> <li>• Successfully use communication at all levels (superiors, colleagues, employees, external partners) to solve problems</li> <li>• Independently develop expertise to solve specific problems</li> </ul>		
Course contents	<u>Internship /BPR / Course no.: PRX.3 / 6th semester / ECTS: 20</u> Students must complete an internship of 19 ECTS = 475 h (12 weeks). This time can be credited to students working in a specific subject. The following contents will be taught during the internship: <ul style="list-style-type: none"> <li>• Supplementing and expanding the knowledge acquired during the course of study through practical activities and questions of commercial law at a company. • The internship ensures that the students are able to find their way around when they start their professional life after their studies and gain confidence in the implementation of their acquired knowledge through the experience they have already gained.</li> </ul> In addition to the internship, the following learning contents are part of this module: <ul style="list-style-type: none"> <li>• Reflection on one's own strengths and weaknesses</li> <li>• Possibilities of self-marketing</li> <li>• Implementation strategies for a personal work-life balance</li> </ul>		
Teaching and learning methods	<u>Internship /BPR / Course no.: PRX.3 / 6th semester / ECTS: 20</u>  Internship		
Evaluation Methods Criteria	<u>Internship /BPR / Course no.: PRX.3 / 6th semester / ECTS: 20</u>  Portfolio		



Module number:	Bachelor Thesis Seminar	Scope:	
		10	ECTS
WIS.3			
Degree program	University of Applied Sciences Bachelor degree program - Energy & Sustainability Management Full-time		
Position in the curriculum	6th semester		
Level	6th semester: Consolidation		
Previous knowledge	6th semester: Scientific and empirical methods (WIS.1), Selected topics scientific and empirical methods (WIS.2) and contents from the modules with links to the topic of the Bachelor thesis of semesters 1 to 5.		
Blocked	no		
Participant group	A-levels and/or corresponding previous training, beginners		
Literature recommendation	<u>Bachelor Thesis Seminar /ILV / Course no.: WIS.3 / 6th semester / ECTS: 10</u> <ul style="list-style-type: none"> <li>• Heisen, M. R., Theisen, M., 2017. Wissenschaftliches Arbeiten: erfolgreich bei Bachelor- und Masterarbeit. Munich: Franz Vahlen</li> </ul>		
Skills acquisition	<u>Bachelor Thesis Seminar /ILV / Course no.: WIS.3 / 6th semester / ECTS: 10</u>  The students are able to: <ul style="list-style-type: none"> <li>• Define a topic independently and formulate a question independently</li> <li>• Present the "state of the art" in the context of the question and, if necessary, critically compare different views</li> <li>• Independently collect, interpret and critically reflect on data with the help of a self-chosen academic methodology, thereby developing and further developing arguments and problem solutions</li> <li>• Present results in a comprehensible manner and according to academic standards in the form of a Bachelor thesis</li> <li>• Organize oneself</li> <li>• Independently prepare and learn knowledge and skills from cross-connections of the course contents for the final Bachelor examination in a systematic manner</li> </ul>		
Course contents	<u>Bachelor Thesis Seminar /ILV / Course no.: WIS.3 / 6th semester / ECTS: 10</u>  The module includes the preparation of a Bachelor thesis of 8 ECTS. Within the framework of the Bachelor thesis, regular meetings are held to discuss the current status and progress of the Bachelor thesis with the accompanying academic supervision. The following content is also taught: <ul style="list-style-type: none"> <li>• Advancing the knowledge of scientific methods in relation to the independent Bachelor thesis</li> <li>• Visualization of scientific results such as posters, video, infographics</li> </ul> In addition to the Bachelor thesis, the final board examination (final Bachelor examination) up to 2 ECTS forms part of this module. Students receive information on the final Bachelor examination and are supported in preparing for the examination.		
Teaching and learning methods	<u>Bachelor Thesis Seminar /ILV / Course no.: WIS.3 / 6th semester / ECTS: 10</u>  Blended learning and supervision of the Bachelor thesis		
Evaluation Methods Criteria	<u>Bachelor Thesis Seminar /ILV / Course no.: WIS.3 / 6th semester / ECTS: 10</u>  Bachelor thesis and presentation		

## 2.4 Internship

The students choose an internship independently. They can draw on the extensive range of internships offered by the Kufstein Tirol University of Applied Sciences. The Director of Studies checks the professional correspondence of the internship activities with the contents of the course and the qualification profiles of the course of studies. Subsequently, the Director of Studies checks whether the internship corresponds to the training objectives of the program and whether the student can be employed according to his/her level of qualification. If these requirements are met, the organizational processing is carried out by the International Relations Office (IRO). A detailed internship guide supports students in organizing their internship semester; students can also contact the IRO and the Director of Studies if they have any questions or need support.

Students must apply for the internship using the form (= occupational profile). The form contains the central data of the student and the internship supervision as well as the goals and the tasks/activities in the company providing the internship. The internship is confirmed or approved by the signatures of the Director of Studies and the internship supervisor.

The student must reflect, document and present the experiences and findings gathered and evaluate the internship. Conversely, the internship supervisor must evaluate the students. The student must prepare an interim report, a final report and a presentation and complete an evaluation form. At the beginning of the internship, he/she will receive an internship guide which lists the points to be worked on. A key requirement is to compare the agreed objectives with the achieved ones. The documentation prepared by the student and the supervisor is evaluated by the Director of Studies. If the achievement of the goals and the adaptation to the qualification level of the student are not guaranteed, the corresponding internship position is excluded for the future. A list and reports on the internships are available to subsequent students via the Moodle teaching platform.

## 2.5 Semester Abroad

The semester abroad is arranged in the 3rd semester of the program. The students expand their basic knowledge from the first two semesters in business administration and economics as well as in scientific and empirical methods. In addition, they acquire competences in communicative processes and presentation. The heterogeneity of the possible course contents - which is given by the different partner universities - leads to an individual further development of each individual student within the framework of the curriculum-related broad competence acquisition in the semester abroad. This strengthens and expands individually existing competences and leads to a desired differentiation and individualization of the students in the context of their studies.

In addition to the subject content, the students advance their knowledge of foreign languages, which they have acquired or expanded in the modules Foreign Language I and II and in the English-language modules. The application of the foreign language knowledge in the university, as well as in daily life, leads to an intensive specialization. In addition, there are competences in intercultural interaction, communication and conflict resolution. Students are able to understand and question different approaches to specific problems in Energy & Sustainability Management. They can describe the dynamics of culture, identity and intercultural encounters and comment on values, stereotypes and prejudices. They also learn about intercultural differences in Energy & Sustainability Management. With this acquisition of competence, students gain the opportunity to obtain a professional foothold in an international context and to more easily take on tasks in multinational companies or with international business partners.

### 3 ADMISSION REQUIREMENTS

The admission requirements at the FH Kufstein Tirol are regulated according to the following terms:

1. The general admission requirements are regulated by § 4 FHG as amended; it applies to **persons with a general university entrance qualification**.

2. **Persons without a school-leaving certificate** must take a **university entrance examination** according to § 64 a UG 2002 as amended. These persons acquire the general university entrance qualification for Bachelor studies in a specialization group by passing the university entrance examination in accordance with an ordinance issued by the Rector's Office of a University. The successful completion of the university entrance examination thus entitles the holder to admission to all studies in the specialization group for which the university entrance qualification was acquired. The university entrance examination can be obtained for certain groups of subjects in accordance with an ordinance of the Rector's Office of a university, whereby the following group of subjects is relevant for the FH Kufstein Tirol: Social and economic studies (e.g. Business Administration, Economic Education, Statistics, Sociology).

Applicants who have completed a 3-year **vocational, middle school, a training in the dual system** or a **subject-relevant German advanced technical college certificate** obtain the entitlement to study at the FH Kufstein Tirol through supplementary examinations in the subjects German, English and Mathematics. In the case of the German advanced technical college certificate, the supplementary examination must only be taken in those of the three subjects in which the grade is "inadequate" or worse. All supplementary examinations must be passed before the start of the third semester.

3. For **individuals with relevant dual training** the **apprenticeship certificate** in one of the following **special fields** according to the respectively valid announcement of the Federal Ministry of Economics, Family and Youth is valid as an admission requirement:

- Construction
- Banks
- Office, Administration, Organization
- Chemistry
- Physics
- Electrical Engineering, Electronics
- Trade
- Information and Communication Technologies
- Metal Technology and Mechanical Engineering
- Transport and Storage

4. **Persons with a degree** from one of the relevant **vocational middle schools** listed below may also be admitted:

- Commercial schools (at least two years)
- Commercial, technical and arts and crafts colleges
- Vocational schools for economic professions
- Technical schools for agricultural and forestry professions
- Commercial schools

Newly emerging apprenticeships in similar fields must be recognized accordingly.

The **group of persons under numbers 3. and 4.** must complete **supplementary examinations** by the beginning of the third semester as an entry requirement and, if necessary, take appropriate preparatory courses. This is possible at the FH Kufstein Tirol.

The following supplementary examinations are required for this group of people:

- German
- English
- Mathematics

Below is an overview of which subject area of the German FOS/BOS is the relevant admission requirement. Here, supplementary examinations must be taken within the first semesters in the subjects Mathematics, German and English (if a grade of "poor" or worse was achieved in these subjects).

#### Relevant admission requirements for the German FOS/BOS

	<b>ENM vzB</b>
<b>FOS</b>	
- Technology	X
- Economics and Administration	X
- Social Welfare	X
- Agriculture, Biotechnology and Environmental Technology	X
- Design	X
- Health	X
- International Business Studies	X
<b>BOS</b>	
- Technology	X
- Economics and Administration	X
- Social Welfare	X
- Agriculture, Biotechnology and Environmental Technology	X
- Health	X
- International Business Studies	X
In the case of relevant internships (trade, administration), other disciplines can also be accepted (after consultation with the Director of Studies).	