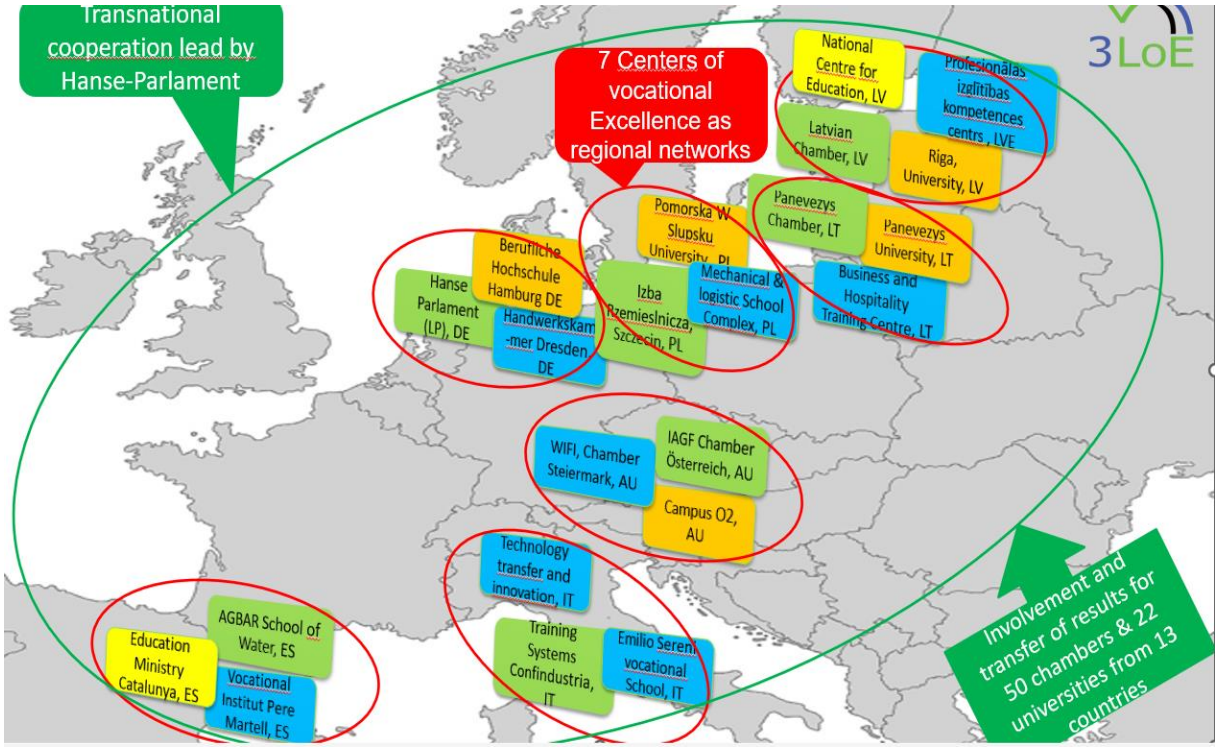
Co-funded by the Erasmus+ Programme of the European Union

Result 5.7

Dual Bachelor program "Sustainable Building System Technology"

Partner



Language

English

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Summary of the Project and Introduction

1. About the 3LOE project

Around 99% of all EU businesses are SMEs, creating up to 70% of all jobs. In general, SMEs have good growth prospects for the future and are particularly well equipped to solve environmental problems and to enhance the green economy. However, in most of the project countries, SMEs are confronted with a shortage of skilled workers and young entrepreneurs. This shortage of skilled workers is even more alarming taking into account that due to aging of current entrepreneurs, a large and growing number of companies will have to be handed over to the next generation. Furthermore, young specialists and entrepreneurs often lack the qualifications and skills needed in order to respond to contemporary developments in the fields of energy, climate and environmental protection. The following problems have been identified in SMEs working in the fields of green economy, energy and environmental protection:

- Blatant and growing shortage of skilled workers.
- Large qualification deficits, especially in the Green Economy.
- Loss of attractiveness and low qualification of school-based VET.
- Low rates of further training and insufficient orientation of offers to SME needs.
- Ageing of entrepreneurs and increasing shortage of young people (demographic change).
- Failure of business transfers and low rates of business start-ups.
- Low innovation rates and insufficient productivity.
- Not enough cooperation between universities and SMEs and a lack of teaching geared to SME needs.
- Comparably low internationalization of SMEs and vocational training providers.
- Lack of national level support for SMEs”.

To meet these challenges, work-based learning and new paths in vocational training must be provided through cooperation between educational institutions, economic chambers and SMEs. University graduates are often well-qualified in theory, but lack practical knowledge, skills and abilities that are crucial for SMEs. For this reason, VET reforms must also involve higher education, and should implement dual bachelor's degree programs that combine a bachelor's degree with vocational training and on-sight work in companies.

In the 3LOE project, an innovative and complex project structure with 22 project partners from 7 countries as well as 60 associated partners from 13 countries was designed. In each country, centers of vocational excellence (COVEs) in Green Economy will be established, managed and their permanent continuation ensured. A transnational cooperation of the centers will be developed, extended to 60 education stakeholders from 13 countries and operated permanently in an institutionalized form. The centers will offer a wide range of dual education measures in vocational training, further education and higher education, that are being developed, tested and evaluated in the project. These educational measures on EQF levels 3-7 focus on Green Economy,

Digitalization and Entrepreneurship. Furthermore, vocational and educational consulting and innovation support for SMEs will be developed and implemented. In total, seven Train-the-Trainer programs will be developed and implemented permanently by the project partners. All results will be transferred to the 60 associated partners together with implementation advice.

The objectives and aimed outcomes of the 3LOE project can be summarized as following:

1. Foundation of a three-level Center in each project country

1.1 Building the "Green Economy" skills alliance for qualifications in SMEs with educational and economic actors from the 7 project countries; development of information and cooperation tools.
1.2 Expansion of the skills alliance to the 60 associated partners from 13 countries, comprising chambers of commerce, SME associations, as well as universities of applied sciences/colleges.
1.3 Development, testing and evaluation of a curriculum and teaching materials for Train the Trainer courses for personnel and center management (vocational schoolteachers, trainers in SMEs and lecturers in further and higher education institutions).
1.4 Evaluation of the construction and operation of the seven centers of Excellence and of the transnational cooperation.
1.5 Development of business and financing plans and ensuring the long-term continuation of the seven centres and transnational cooperation.
1.6 Development, consulting and introduction of political strategy program.

2. Implementation and realization vocational training

2.1 Development and implementation of a tool for vocational and qualification counselling as well as a training for consultants and teachers to use the tool.
2.2 Implementation of the dual system, so that work-based learning is put into practice in the project countries.
Preparation and transfer of curricula and examination regulations for dual vocational training for different professions and implementations in Poland, Lithuania, Latvia and Spain.
Development, test and implementation Trainings for teachers to conduct dual vocational training as well as Training of trainers in SMEs.
2.3 Development political concept for the training and integration of young people with learning difficulties for young people with learning difficulties (EQF level 3).
Development, test and implementation of a dual vocational training "Specialist for Building Insulation".
2.4 Development, testing and evaluation of education programme, teaching materials and examination regulations for the provision of sector-specific qualifications already during the initial vocational training for stronger learners. Implementation in the dual system, so that work-based learning is put into practice in the project countries.

2.5 Development and implementation five-year technician training „Ecologic Solutions in Logistics".

3. Implementation and realization of further vocational training

3.1 Development and implementation of concepts and instruments for the management of continuing vocational training.
3.2 Development, test and implementation of a Train-the-Trainer program for teachers to conduct further training.
3.3 Development and implementation of a concept "SME-fair digitalization" as well as development, test and implementation of two train the trainer programs "Basic and advanced digital skills".
3.4 Transfer and implementation of four further trainings Energy Saving and Renewable Energies.
3.5 Preparation, transfer and implementation of six further trainings in the Green Economy.
3.6 Development, testing and evaluation of different training programs and teaching material for owners, managers and qualified workers of SMEs (EQF level 5 and 6). The trainings are specifically tailored to SME needs and different qualification levels and combine the transfer of technical, professional and management know-how.
- Training Enterprise and Entrepreneurship in Green Economy
- Training Energy Service Manager
- Trainings vocational Master Carpenter and Electric
- Training Construction Technician
- Training Service Technician
- Training Sustainability in foodservice industry

3.7 Development of regulations for new continuing education occupational profiles with a focus on the green economy.
3.8 Development of an integration programme for the unemployed (EQF level 4) in order to be able to place the unemployed in permanent jobs through further training seminars and a further training qualification.

4. Implementation and realization of higher education

4.1 Preparation and transfer of curricula, evaluation and examination regulations for two existing dual Bachelor degree programmes "Management of Renewable Building Energy Technology" and "Business Administration for SMEs".
4.2 Development and beginning of implementation of new dual Bachelor degree programs
- Business Administration & Sustainable Management of SMEs
- Entrepreneurship and Innovation in Green Economy
- Logistics - Green Supply Chains
- Sustainable Building System Technology
- Tutorial "Sustainable management Climate neutrality for companies"

4.3 Development, test and implementation of four study modules (EQF level 6) on SME management in the Green Economy sector, which will be carried out in the dual study system and integrated into existing Bachelor degree programmes.
4.4 Development and implementation of concept for innovation promotion Solutions for manageable R&D tasks of SMEs and conducting manageable R&D projects for SMEs-
4.5 Development, testing and implementation of Training program for university lecturers and SME advisors.

5. Dissemination, transfer and use of the project results

5.1 Development of a concept and summary evaluation of the dissemination results of all partners
5.2Transfer of all educational measures to 60 educational institutions in 13 countries and needs-oriented implementation consultations as well as realization of a bundle of measures for further dissemination of the project results.
5.3 Further dissemination activities such as presentations online, at third-party events, press releases and conferences.
5.4 Book with all results of the project and distribution via book trade.

For each of the three levels of educational measures there will be:

- Target-group-specific educational programs.
- Curricula, teaching materials, etc. developed in a leading role by the educational institutions of the respective level, whereby the educational institutions of the other levels (in particular universities) participate in an advisory and supportive manner.
- Representatives of the participant target groups involved in the development work.

All educational measures will be tested with the respective target groups under different national conditions in the countries, evaluated and completed on the basis of the evaluation results with application notes.

2. About the Dual Bachelor program “Service technician”

During the first six months of the project, all partners of the seven COVEs discussed and agreed in detail that:
a) dual Bachelor's degree programmes should be developed and implemented.
b) the following existing dual Bachelor's degree programmes should be revised and transferred to all seven COVEs
- Management of Renewable Building Energy Technology
- Business Administration for SMEs
- Four study modules "Green Economy"

c) a new dual Bachelor's degree programme "Business Administration & Sustainable Management of SMEs" is to be developed.
This work was carried out, implementation was advised, and realisation began in all COVEs during the project period.

After the seven COVEs had started their work, they were confronted with urgent needs and requests for the development and implementation of further dual study programmes from public administrations, colleges, universities and companies in the countries that had not yet implemented dual study programmes from the second year of the project. In order to meet these priority needs in the regions; the development and implementation of the following dual study programmes was also included in the work of the 3LOE project:

- COVE Latvia: Entrepreneurship & Innovation in Green Economy
- Cove Poland: Logistics - Green Supply Chains
- COVE Austria: Sustainable Building System Technology
- COVE Austria: Sustainable management Climate neutrality for companies

As the work could only begin in the second year of the project and the development work and necessary accreditations were very labour-intensive and time-consuming, it was only possible to begin with the first implementations during the project period. However, the further implementation of all four additional study programmes is guaranteed after the end of the project period. In addition, all documents relating to the four additional degree programmes were transferred to all other COVEs during the project period and implementation was discussed and prepared here.

The results achieved by COVE Austria for the dual study programme "Sustainable Building System Technology" during the project period are presented below.

Concept and Curriculum "Sustainable Building System Technology"[1]

1. GENERAL DESCRIPTION OF THE BACHELOR PROGRAM

Call for Proposals Category:
Beginner Study Places for Innovative Study Programs Focused on STEM and the Challenges of Digital and Ecological Transformation

Field of Study:
Engineering

Organizational Form:
Part-time

Duration of Study Program:
6 semesters, 180 ECTS Credits

Number of Beginner Study Places:
25

Full Capacity:
75

To optimally operate a building in terms of resource efficiency, the interaction of different technologies and trades is required. The focus is on energy supply and consumption optimization, heating technology, air conditioning, cold and hot water usage, thermal insulation, and acoustics.

Building systems engineering broadly covers these topics, networking the systems and their components and, with the help of digitization, is geared towards sustainability. This holistic approach enables the transition to a sustainable economy and society.

The Bachelor's degree program Sustainable Building Systems Technology focuses on digital, energy-efficient solutions in the building sector in response to the challenges of climate change.

Graduates of the Bachelor's program Sustainable Building Systems Technology are comprehensively and diversely qualified after their solid, technically-oriented training. The program follows the philosophy of holistic project management, starting with conceptual development, coordination (of implementation and trades), configuration (of

[1] Prepared by Campus 02 Fachhochschule der Wirtschaft GMBH, Austria

components), and their control, along with any necessary systemic/parametric adjustments.

Graduates acquire both technical and interdisciplinary competencies, qualifying them to meet specific challenges in building systems engineering. They can utilize the latest technologies to address the challenges of digitization, automation, and networking in the context of sustainable building technology. Knowledge of English, communication skills, and soft skills, as well as a basic understanding of economics, round out their overall profile.

The acquired skills are directly applicable to areas such as planning, system analysis, application integration and development, and technical disciplines like measurement and control technology, test and experimental technology, construction, computer-based simulations, and technical project management.

The program is developed in collaboration with leading companies in industries relevant to building systems engineering to ensure that students acquire the necessary skills. The curriculum combines theoretical knowledge with practical applications and includes modules from the fields of natural sciences, computer science, electrical engineering, building technology, and automation. Additionally economic and ecological content is also included. Figure 1 illustrates the focus and basic structure of the program.

Key Focus Areas:

- Digitization and automation in the building sector
- Integration of renewable, innovative energy technologies
- Energy management and load flow optimization

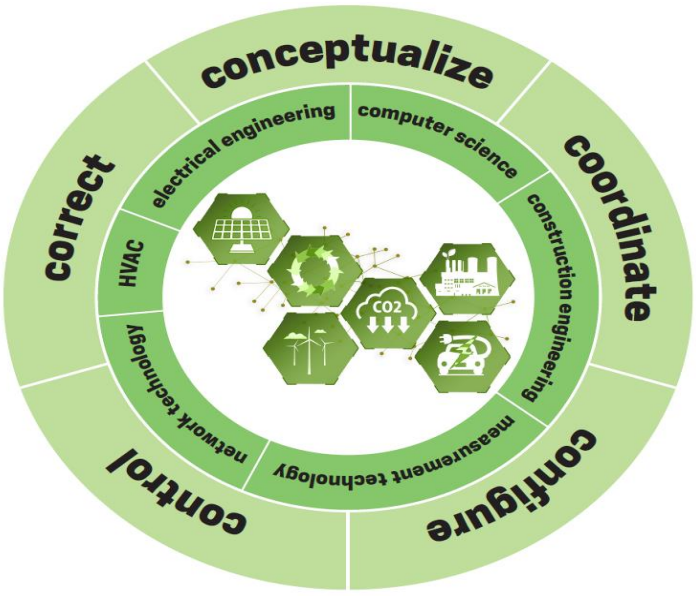


Figure 1: Basic structure and focus of the developed program

2. CRITERIA MET

2.1 MEASURES FOR THE SUSTAINABLE DEVELOPMENT OF STUDY PROGRAMS

CAMPUS 02 UAS has been offering a part-time degree in Automation Technology since 1996 (from 1996 to 2004 as a diploma program, since 2005 as a Bachelor's program, and since 2008 as a Master's program in Automation Technology and Economics). Additionally, since 2021, the English-language Bachelor's program in Smart Automation has been offered.

The planned Bachelor's degree in Sustainable Building Systems Technology, offered part-time, represents both a further development of the university's technical focus and a new target group in the field of HVAC teaching and master graduates, as well as relevant HTL (technical high school) graduates. This part-time program enables companies to further qualify their employees while addressing the increasing demand for technical staff, as confirmed by a survey of Styrian leading companies and SMEs.

The Department of Automation Technology has been significantly contributing to training skilled professionals and experts who use, develop, and optimize innovative technologies. The department focuses on increasing digitization, and research and development projects at the EAS Lab (Energy Analytics and Solution Lab), primarily dedicated to electrical energy technology, also address the building sector. The EAS Lab will also be available for lab exercises in the new Bachelor's program.

2.2 COLLABORATIONS

The Bachelor's degree in Sustainable Building Systems Technology was developed during the course of the international EU Research & Development project 3LoE – Three-level centers of professional excellence. The project, funded by the European Union, developed teaching content in the areas of digitization and ecological transformation. In this consortium of around 60 project partners, including the Department of Automation Technology at CAMPUS 02 UAS, future topics related to sustainability and digitization were and continue to be jointly developed, tested, and evaluated by the project partners.

The Automation Technology Platform of Styria, consisting of 137 companies and educational/research institutions, is also discussing and positioning future topics in the field of digitization and building automation. This cooperation is a crucial factor in securing necessary internships and Bachelor thesis topics, with companies from this network actively involved in the program's development.

The long-standing cooperation with WIFI Styria will be expanded in terms of shared infrastructure with the Bachelor's program in Sustainable Building Systems Technology. This avoids the creation of duplicate infrastructures and promotes continued studies at WIFI. The Chamber of Commerce's investment of approximately €40 million in the newly built CoE (Center of Excellence) in Graz provides state-of-the-art infrastructure (covering 14,200 square meters) for practical training in modern building systems engineering. The first phase is already completed, and teaching began in April 2024. The proximity to CAMPUS 02 UAS is another advantage for efficient study operations.

2.3 PART-TIME STUDIES

CAMPUS 02 UAS primarily offers part-time programs. The curriculum is designed in coordination with the Automation Technology Platform and WIFI Styria to ensure a smooth transition from studies to work. From more than 25 years of experience with part-time programs, the continuous practical relevance of students, 95% of whom are employed in relevant fields, has proven to be a key success factor. To allow students to remain employed, the program is designed with optimal in-person attendance based on previous experience. The existing Master’s program in Automation Technology and Economics enables part-time professional advancement from skilled worker to management level.

The part-time study model offers the significant advantage that students remain active in the workforce, thus contributing to the energy transition, without increasing the skills shortage. Overall, part-time study remains an attractive option for professionals seeking to enhance their career prospects without leaving their jobs.

2.4 TECHNICAL COMPONENT

The technical component, including natural sciences, makes up approximately 86% of the UAS Bachelor’s program in Sustainable Building Systems Technology.

CAMPUS 02 UAS is committed to providing a current, quality-oriented education, incorporating both general digital literacy and job-specific digital skills. The curriculum includes field-specific software tools for planning, development, calculation, and simulation. Moreover, it adapts to current hardware and software products for the digitization of businesses and processes.

Since March 2024, CAMPUS 02 UAS has held the *Excellence in Digital Education* quality seal from FIBAA, which recognizes outstanding digital teaching competencies.

Both the diploma (1996–2004) and Bachelor's programs in Automation Technology (since 2005) at CAMPUS 02 UAS have consistently seen more applicants than

available places, leading to two increases in available spots. There is currently no similar program available in southern Austria.

2.5 PROMOTION OF WOMEN

Through the FIONA project (financed by LEA Austrian Women's Fund), CAMPUS 02 UAS aims to make it easier for women to enter technical fields of study, supporting them throughout their studies. This strategically planned program includes pre-study coaching, student empowerment through targeted learning support in a mono-educational setting, and networking throughout the student life cycle. The project involves collaboration between the Departments of Automation Technology, Business Informatics, and Innovation Management at CAMPUS 02 UAS.

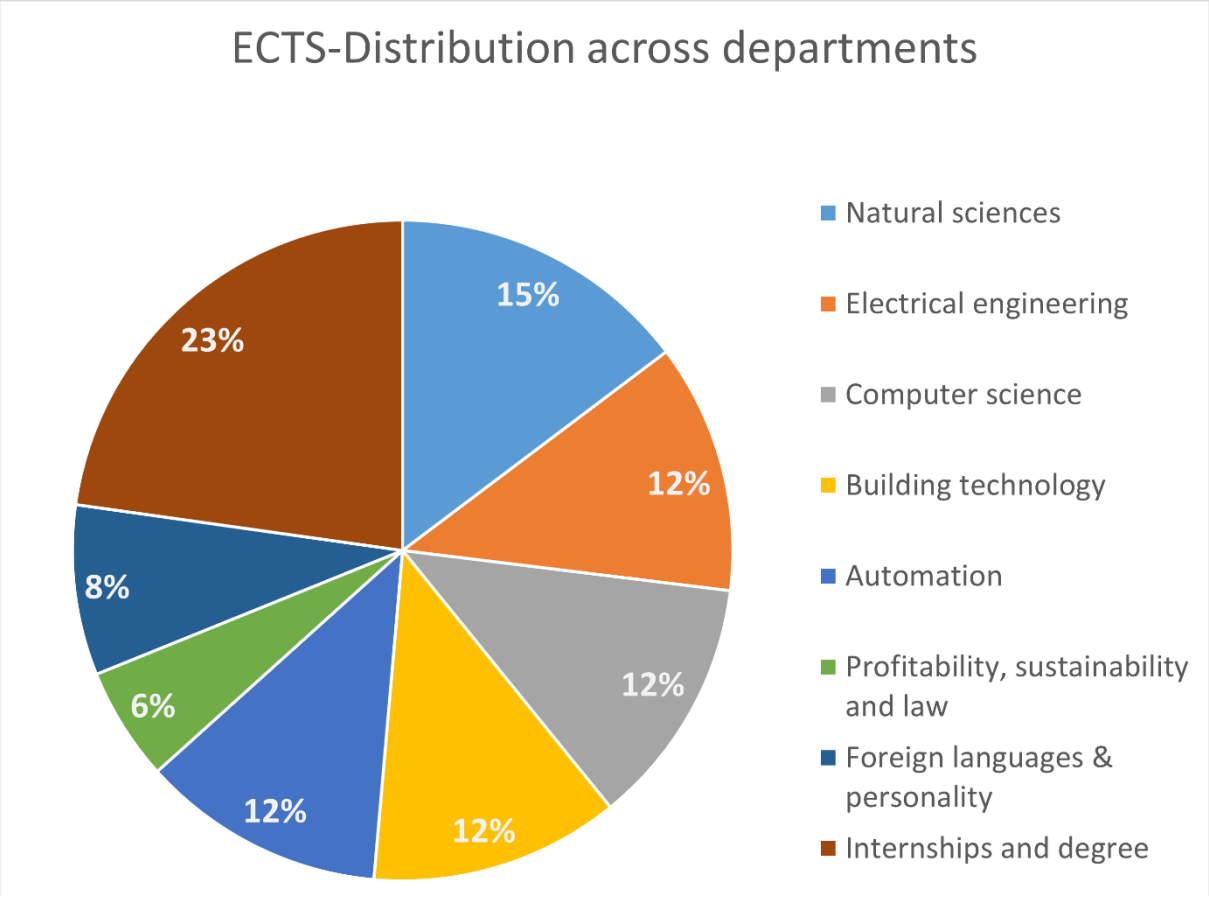
3. STRUCTURE OF THE CURRICULUM

The following chapter shows the composition of the curriculum. A total of 30 ECTS must be achieved in each semester to obtain the required number of 180 ECTS spread over all 6 semesters.

At the beginning there is a simplified presentation to give an overview of the main topics. This is followed by a detailed compilation of the various courses.

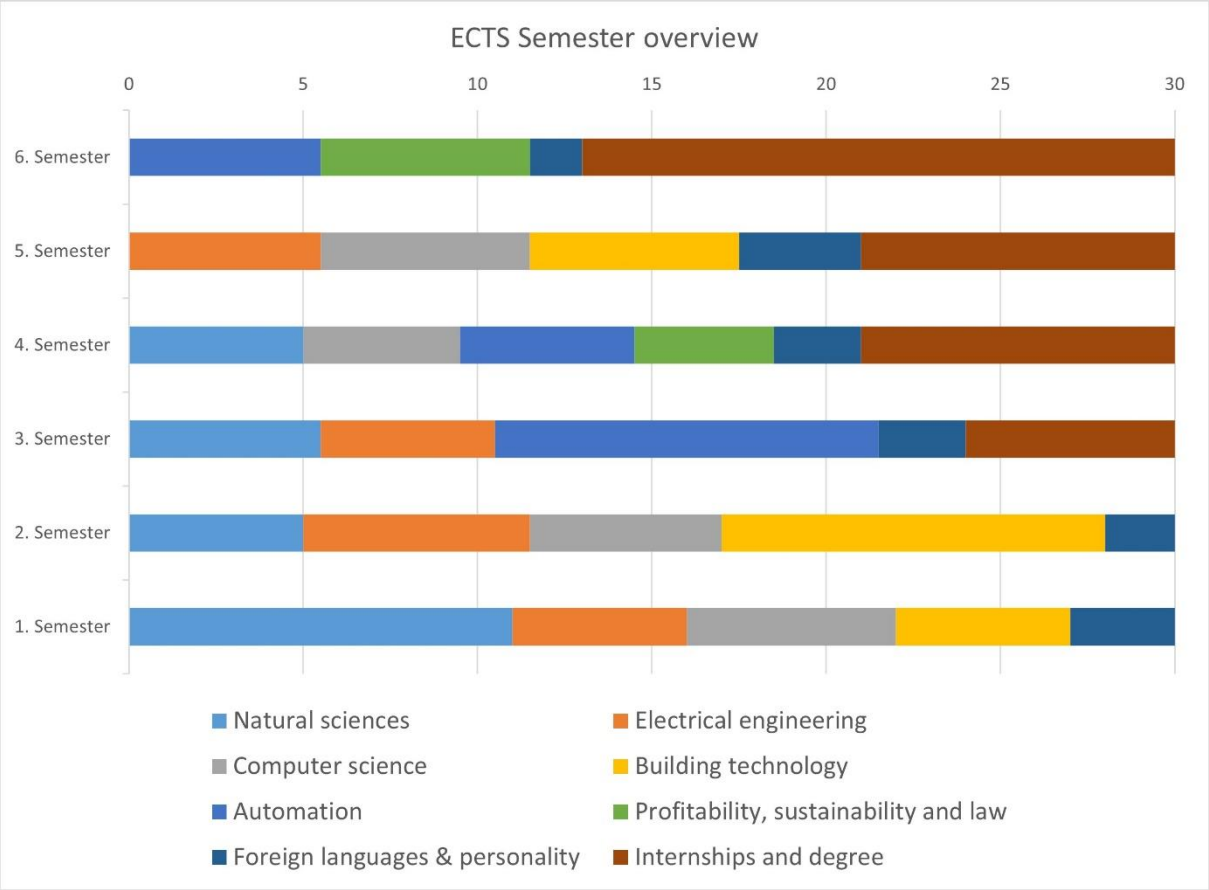
3.1 SUBJECT AREAS AND ECTS ALLOCATION

The following simplified diagram shows the percentage structure of the various key topics/disciplines.



3.2 ECTS SEMESTER OVERVIEW

The weighting of the ECTS in the disciplines per semester is shown in the following bar chart and is intended to provide an overview of the focal points as a function of the entire course of study.



4. MODULES

The following section contains a list of all subject areas and their included modules. The color coding of the modules refers to the identically marked subject area.

Department	Abbreviation
Natural science	NS
Electrical engineering	EE
Computer science	CS
Building technology	BT
Measurement, control and regulation technology	MCR
Profitability, sustainability and law	PSL
Foreign language and personality	FLP
Internships and graduation	IG

Module name	Abbreviation	Department
Mathematics Basics	MB	NS

Building on the level of the school-leaving examination, students acquire advanced knowledge and an understanding of the basic concepts and methods in the sub-areas of mathematical foundations and linear algebra and can apply these in examples. Building on the mathematical foundations, students can develop and implement application-specific solutions and evaluate their results.

Physical and building technology basics	PBT	NS

In the module “Fundamentals of Physics and Building Services Engineering”, students are given a comprehensive insight into the fundamental principles of physics. The module also focuses on building technology contexts. Through theoretical principles and practical applications, they develop a sound understanding of physical phenomena and their practical relevance.

Mathematics specialization	MS	NS

Building on the fundamentals of mathematics, students acquire advanced knowledge and an understanding of differential calculus and integral calculus

Statistics and data analysis	SDA	NS

Students learn methods and tools that are used in the context of statistical calculations and data analyses and their optimization.

Applied mathematics	AM	NS

Students acquire knowledge of the mathematical processes and mathematical ways of thinking required for professional practice and can use mathematical transformations as a tool for problem solving in the technical field and as an instrument for information acquisition, data analysis, data processing and data optimization.

Electrical engineering basics	EEB	EE

The module “Electrical Engineering Fundamentals” offers students a comprehensive insight into the elementary principles of electrical engineering. Various renewable energy systems are also covered. Students develop a solid understanding of electrical systems through theoretical principles and practice-oriented applications.

Electrical engineering specialization	EES	EE

As part of the module “Advanced Electrical Engineering”, students acquire detailed knowledge in the field of alternating and three-phase current technology, building on the General Electrical Engineering lecture. As part of the laboratory exercises, they learn the practical implementation and application of the knowledge acquired in the electrical engineering courses.

Applied electrical engineering	AEE	EE

In the “Applied Electrical Engineering” module, students acquire detailed knowledge in the field of energy technology and electrical installations. They will be able to select and apply processes for energy generation, energy distribution and the conversion of electrical energy as well as the energy-

efficient use of modern automation systems. The aim of the “Electrical Installations” course is to familiarize students with the relevant equipment and standards for electrical installations in the building sector.

Technical planning	TP	EE

The 'Technical Planning' module teaches practice-oriented skills for the standard-compliant planning of electrical systems. Knowledge in the field of Building Information Modeling is also taught.

Computer science basics	CSB	CS

Many processes in modern building technology are described by algorithms and flow charts. On this basis, it is important to implement the desired behavior through hardware or software solutions. In this module, students therefore acquire basic knowledge of both approaches.

Software development and visualization	SDV	CS

The module “Software development and visualization” provides basic knowledge of software development and visualization of process data. Students can apply different process models in software development and software testing. Students learn practice-oriented methods, state-of-the-art tools and creative approaches to prepare and visualize complex data structures.

Applied computer science	ACS	CS

Building on the previous modules, students acquire in-depth knowledge in the field of data archiving and data interfaces. They can archive data from different sources in database systems in a targeted manner. As part of the laboratory exercises, the “Applied Computer Science” module provides practical knowledge in the areas of software development, microcontroller technology and network technology.

Neural networks	NN	CS

Students acquire basic knowledge of neural networks and machine learning methods, their functionality, structure and use.

Ventilation and heating technology basics	VHB	BT

Students acquire basic knowledge of heating technology as well as sanitary and ventilation technology.

Heating and cooling technology specialization	HCS	BT

Students acquire basic knowledge in the field of heating technology, in the provision of thermal energy. The main focus is on regenerative thermal energy systems in the private and commercial sector. Students acquire basic knowledge in the field of air conditioning and refrigeration technology. In addition to the basics of building cooling, they also learn about ventilation and process air technology systems. Practical laboratory exercises are used to consolidate the theoretical content.

Planning and supply engineering	PSE	BT

Students acquire basic knowledge in the field of design and planning of HVAC systems. The main focus is on the two-dimensional representation of technical systems and the associated necessary planning views such as sectional views, floor plans, etc. in compliance with technical standards. Students acquire

knowledge and working methods in the field of system planning, particularly in the private and commercial environment. Building on this, students acquire methods for networked planning and geometric visualization with the help of various software packages with a focus on building technology.

Building technology specialization	BTS	BT

Students acquire relevant knowledge in the field of supply, in particular the use and purpose of different technologies of energy systems in the private and commercial environment. Students acquire the basic knowledge to develop solutions to problems relating to components with flow through and around them and the transfer of heat in different components.

Measurement technology and sensor technology	MST	MCR

The measurement technology and sensor technology module provides students with in-depth knowledge in the field of recording metrological variables. Students learn about various measurement interfaces and transducers. In addition, the functionalities and possible applications of various sensor technologies are discussed so that students can independently select sensors for a selected application.

Control and regulation technology basics	CTB	MCR

In the module “Control Engineering Fundamentals”, students acquire in-depth knowledge in the field of modern control engineering and basic control concepts. Students learn about important control technology equipment. The aim is to provide students with an overview of the state of the art in the field of control technology and to impart relevant knowledge in the area of planning and calculating control loops.

Building automation	BA	MCR

The Building Automation and Management module provides comprehensive knowledge in the field of building automation. Students gain insights into central systems and technologies for building control and regulation. Students acquire in-depth knowledge of control engineering, which enables them to design and optimize complex control loops in order to improve the efficiency and functionality of building automation systems. The aim is to provide students with a sound understanding of the current state of the art in building automation and to equip them with the necessary skills to plan, implement and maintain automated building systems.

Integrated planning and networks	IPN	MCR

The “Integral Planning and Networking” module provides students with in-depth knowledge of the design, simulation and optimization of construction projects and technical systems. Students learn how to integrate safety requirements and improve the reliability of technical infrastructures and networked systems. They also acquire skills in maintenance and optimization in order to maximize the performance of buildings. The module prepares them to develop innovative solutions as technical experts in interdisciplinary teams.

Business administration and project management	BPM	PSL

"After completing the course “Introduction to Business Administration”, graduates have a holistic, systematic overview of the fundamental characteristics and processes of entrepreneurial activity and the role of managers in the company. In particular, the different levels of corporate management are

discussed. In addition to imparting subject-specific knowledge, this module focuses on the development and expansion of methodological and social skills.

Graduates of this module understand how to see a company as a whole. They learn to think in terms of processes. They establish cross-references between the specialist areas and solve complex problems by reducing any excess information to the essentials. "

We do business	WB	PSL

"Students at CAMPUS 02 should have the opportunity to get to know selected parts of the competence portfolios of other fields of study and other universities and gain transdisciplinary experience in line with the motto “We do business”. In this way, the guiding principle of CAMPUS 02, specifically the representation of essential business functions in its teaching and R&D offerings, should become visible and tangible for students. This increases the number of options available to students as well as the attractiveness of the respective degree program.

In the following, one's own degree program is referred to as the “sending degree program” and other degree programs or external educational institutions as the “receiving institution”. In the middle of the 5th semester, the sending degree program actively solicits offers from other degree programs at CAMPUS 02. Offers from external receiving institutions can be proposed by both students and lecturers. Suitable offers are approved and announced by the course director before the start of the 6th semester. Students can select courses or combinations of courses worth at least 5 ECTS credits as electives from this portfolio.

The sending degree program also offers its own courses (see course descriptions for this module). In this course, students acquire basic knowledge in the areas of business accounting, particularly an overview of cost accounting skills. In addition, students deal with the basics of investment and financing. The course “Company and Corporate Law” is intended to lay the foundation for students to be able to classify economic issues in the legal system of standards and to recognize their legal relevance. The aim of the course “Corporate Sustainability” is to develop and present an integrated sustainability strategy with an international focus, either alone or in a team, using theoretical and practical methods, as well as to and present it, as well as to monitor its operational implementation and carry out appropriate checks. "

Soft skills and communication basics	SCB	FLP

The module “Soft Skills and Communication Fundamentals” teaches essential communication skills and improves English language skills for technical and scientific contexts. Students learn effective time management and teamwork, including understanding roles and team dynamics. An introduction to Sustainable Building Systems Technology rounds off the module, which prepares students to communicate successfully in interdisciplinary and international environments.

Soft skills and communication specialization	SCS	FLP

The “Soft Skills and Communication Consolidation” module develops advanced communication and language skills for technical professions. It expands English language skills through two courses and strengthens negotiation and conflict management techniques. In addition, students improve their presentation and rhetorical skills to communicate effectively. The module prepares them for responsible tasks in technical fields.

Professional knowledge and Professional English	PKE	FLP

The module “Scientific Writing and Professional English” combines basic skills in writing scientific texts with intensive English lessons specializing in technical and business communication. It includes English courses that strengthen language skills for professional and academic requirements. The Scientific Writing course teaches core techniques for writing scientific documents. This module prepares students to communicate effectively and write academic papers.

Internship 1	IP1	IG
Internship 2	IP2	IG
Internship 3	IP3	IG
Internship 4	IP4	IG

The idea of the module is to apply for a subject-related internship and systematically document the experience gained there. The theoretical knowledge acquired during the course should be applied to real operational problems in order to deepen one's own knowledge and develop practical solutions.

Project work	PW	IG

At a technical level, the focus is on expanding and applying the theoretical knowledge acquired in a practical environment. Projects are offered in the fields of measurement data acquisition and analysis, building automation (smart home), microcontroller technology, PC interface technology and electrical planning. In addition, topics from current R&D projects are integrated as required. Within the framework of “Project work 1” and “Project work 2”, an individual selection of topics must be made for each group. At the level of personal and social-communicative skills, the focus is on self-assessment, self-organization and critical reflection (e.g. assessing the outcome of the project) as well as goal- and relationship-oriented work in the group. Students with different educational backgrounds work together in project teams with an interdisciplinary approach and develop joint solutions. The work is continuously documented, and the results are finally presented in the form of a project poster and presented by the group.

Compulsory elective subject specialization	CES	IG

In the compulsory elective specialization module, students acquire in-depth theoretical and practical knowledge in a specialist area of their choice.

Bachelor thesis	BT	IG
Bachelor examination	BE	IG

In the Bachelor's degree program, students are required to independently write a Bachelor's thesis of around 50 pages, which is carried out as part of the courses “Seminar on the Bachelor's thesis” in the 5th semester and “Bachelor's thesis” in the 6th semester and is supervised in terms of subject, method and process, whereby the principles of scientific work and the guideline “Form of written work” are applied to the Bachelor's degree program in Sustainable Building Systems Technology.

5. COURSE ALLOCATION AT SEMESTER LEVEL

The following compilation is intended to provide a detailed insight into the curriculum. The composition of the curriculum is technically oriented, but there are seminars in every semester to improve and strengthen the social skills of students.

In addition, students complete internships in the summer semesters, which usually take place in their own company. The idea is to enable students to apply and use the knowledge they have acquired at university in the company during their studies.

In the first semester, the focus is on strongly practice-oriented lectures as well as preparation for the process of writing the Bachelor's thesis. The semester covers fundamental topics in mathematics, physics, and engineering, including complex numbers, systems of equations, statics, dynamics, building physics, electrical circuits, and renewable energy systems like photovoltaics and wind energy. It also includes programming basics in Python, network technology, operating systems, as well as essential building systems like heating, ventilation, and water systems, complemented by soft skills in communication, teamwork, and time management, along with technical English at the B2 level.

Semester 1		
Course	***ECTS Credits***	***Content***
Mathematics basics	**5**	Quantities, numbers, statements and proof procedures Complex numbers and elementary functions, Limit values and continuity, Linear systems of equations
Physics basics	**1,5**	Physical basics, International System of Units, Statics, Dynamics, Electromagnetic waves
Building physics and building fundamentals	**4,5**	Building physics basics, Thermal building calculations, Building and insulating materials, Moisture protection, Thermal optimization, Acoustics & sound insulation
General electrical engineering	**3**	Physical basics (electrical charge, electrical energy, electrical current, electrical resistance, energy conversion in the consumer), Calculation of electrical circuits, Electrostatic field, Magnetic field
Renewable energies	**2**	Photovoltaics (structure, function and application of PV systems), Wind energy, Hydropower, Fuel cell, Alternative energy sources and storage
Introduction to programming	**2**	Algorithms, flow chart, Development environments, Basic constructs: Instruction, assignment, loop, condition, Program, Software, Programming, Implementation of examples in the Python programming language
Technical information technology basics	**4**	Number display and codes, Digital logic and switching algebra, Basics of operating systems, Microprocessor architecture, Ethernet basics and technologies, Network basics and network access, Network technology equipment, TCP/IP protocol family and IP addressing
Sanitary and ventilation technology	**2**	Drinking water and drainage systems, Systems for heat generation and heat distribution, Systems for heating drinking water, Ventilation and air conditioning systems
Heating technology	**3**	Thermal energy systems, Heating systems, Planning and dimensioning
English for Science	**1**	Basic grammar as required on B2 level, making contact and introductions, small talk, Summarizing newspaper texts, video clips, listening, Technical topics (Natural Sciences, Physics, Mathematics)
Communication and time management	**0,5**	The basics of teamwork, Basics of time management, Basics of communication

Introduction 'Sustainable building systems technology'	**1,5**	Introduction to building technology, Introduction to energy technology, Climate change, Energy transition
Total ECTS in the semester	**30**	

Building on the basic lectures of the first semester, the practical skills of students are strengthened in the second semester with accompanying laboratory exercises. The semester covers core engineering concepts such as differential and integral calculus, AC circuit analysis, three-phase technology, and the fundamentals of energy and HVAC systems. It also includes topics like software project management, data processing, control systems based on industry standards, computer-aided design, and essential soft skills such as team models, role concepts, and technical English at a B2 level.

Semester 2		
Course	***ECTS Credits***	***Content***
Mathematics specialisation	**5**	Differential calculations, Differential calculation of several real variables, Ordinary differential equations of 1st and 2nd order, Integral calculus
Alternating current technology	**3,5**	Representation and calculation of sinusoidal variables, Ideal passive components (R, L and C) in the AC circuit, Law of induction, Basic circuits of passive component combinations, Power in the AC circuit, Three-phase technology
Electrical engineering laboratory	**3**	Parameters and sources, measuring devices and measuring circuits, Protocol
Software development	**2**	Requirements analysis, functional specification, specification sheet, Delivery, distribution, installation, Software architecture, Software test, Process models, Implementation of software projects
Data preparation and structuring	**2**	Characterization and use of digital data, Preparation of data, Data cleansing, Data visualization
Control and visualization technology	**1,5**	Overview of control and visualization systems, Requirement characteristics of modern systems with reference to important relevant standards (IEC 61131/61499), Methods for data exchange between different user programs on one computer, IT-supported production control technology based on the ANSI ISA S88/S95 standards
Air conditioning and refrigeration technology	**3**	Basic variables in air conditioning and refrigeration technology, Air conditioning basics, Refrigeration basics
Heating and air-conditioning technology laboratory	**3**	Heating technology, Measurement and control in heating technology, Ventilation and air-conditioning technology
HVAC planning and execution	**3**	Representation types and technical drawings, Computer-aided design and modeling, Calculation, design and documentation
Supply engineering	**2**	Fundamentals of the material supply infrastructure, Basics of the energy supply infrastructure, Basics of process supply
Team and role models	**1**	Concepts of team models, Concepts of role models
Technical English	**1**	Basic grammar as required on B2 level, technical topics Debates and opinions
Total ECTS in the semester	**30**	

In the third semester, the focus is increasingly on electrotechnical and control engineering content. The semester covers a broad range of topics, including statistical methods like regression, probability theory, and machine learning, alongside electrical engineering fundamentals such as power generation, energy grids, and electrical safety in buildings. It also addresses control technology, sensors and actuators, measurement techniques, and conflict management, while incorporating technical English skills, and applying learned knowledge to real-world operational problems through internships.

Semester 3		
Course	***ECTS Credits***	***Content***
Statistics	**3,5**	Equalization calculation, linear and quasilinear regression, Introduction to statistics: discrete and continuous distributions, Fundamentals of probability theory, Descriptive statistics, Statistical tests
Data analysis and optimization	**2**	Descriptive, inferential and explorative data analysis, Time series and geospatial data analysis, Data mining and pattern recognition, Data identification, data integration, data aggregation and data compression, Machine learning and big data analytics
Energy technology	**2,5**	Electrical power generation, Energy distribution grids, Energy storage, Energy consumer, Energy industry
Electrical installations	**2,5**	Electrical equipment in the building sector, Electrical safety precautions, Electrical power distribution
Measurement technology	**2,5**	Analog and digital measuring interfaces, Structure and mode of operation of measuring techniques, Measurement of process parameters
Sensors & Actuators	**2,5**	Structure and function of sensors, Specifications and areas of application for sensors, Functionality of actuators, Actuator specifications and areas of application
Control technology	**2,5**	Basic circuits and functions of control technology, Programmable logic controllers, Safety-relevant aspects of control technology
Control engineering basics	**3,5**	Basics of control and regulation, Control procedure, Design of control systems, Simulation and modeling
English for Engineers 1	**1,5**	Revision of some technical topics from 1st and 2nd semester, Reported Speech, Conditional clauses, Basic grammar as required on B2 level, Safety precautions (Health and safety at work), Describing objects, graphs and charts, Describing statistics
Conflict management and negotiation techniques	**1**	Basics of conflict management, Conflict phases, their effects and intervention options, Communication and relationship building, Flexibility and strategy
Internship	**6**	Apply for a subject-specific internship and document it, Apply learned content to operational problems
Total ECTS in the semester	**30**	

In the fourth semester, in addition to the technical specializations, the economic aspect in the technical environment begins to take effect. The semester covers advanced mathematical and engineering topics, including numerical methods for differential equations, Fourier analysis, systems theory, and computer algorithms, alongside practical applications like microcontroller technology, building automation systems, and web-based data transmission. It also focuses on project management, business administration, and communication skills, emphasizing project planning, presentations, and technical writing, as well as applying learned knowledge to real-world operational problems through internships and hands-on projects.

Semester 4		
Course	***ECTS Credits***	***Content***
Computer algebra	**1,5**	Finite element and difference method, Numerical and symbolic integration and differentiation, Numerical solutions of differential equations, Computer algebraic algorithms and geometry
Applied mathematics	**3,5**	Harmonic analysis: Fourier series and transforms, DFT, FFT, Introduction to the theory of continuous-time and discrete-time LTI systems and the mathematical foundations of systems theory, Various methods for solving differential equations and systems of differential equations (Laplace transformation, analytical and numerical methods)
Applied computer science laboratory	**1,5**	Programming environment, Programming algorithms, Network technology, Microcontroller technology, Specifications and documentation
Data interfaces and database systems	**3**	Applied data communication, Web-based data transmission, Programming interfaces, Data archiving and database systems, Database management, Advanced data visualization
Building automation system	**2,5**	Building automation systems and their operating equipment, Building management system, Smart Home/Building, Implementation of building automation systems
Control engineering specialization	**2,5**	Applied control technology in building services engineering, Dynamic systems, Adaptive and predictive control, Fuzzy logic control
Introduction to business administration	**2,5**	Basic concepts of business administration, Normative framework, Strategy and strategy design,Organization and organizational design, Personnel and management
Project management	**1,5**	Basics, Project assignment, Project start (project planning), Project documentation, Project management content, Project controlling, Project completion
English for Engineers 2	**1,5**	Giving instructions for using a machine (operation manual) and describing work processes, Complex sentence structures (relative clause, subordinate clauses of result and purpose), Abstract writing, Presentations of projects, Technical topics, Passive voice
Präsentation und Rhetorik	**1**	Rhetorical means, Presentation techniques, Argumentation strategies, Audience analysis
Accompanying projects 1	**3**	Topic selection and theoretical introduction to the selected topic, Project planning, Project implementation, Project documentation, Project presentation
Internship	**6**	Apply for a subject-specific internship and document it, Apply learned content to operational problems
Total ECTS in the semester	**30**	

In the fifth semester, the focus is on strongly practice-oriented lectures as well as preparation for the process of writing the Bachelor's thesis. The semester integrates technical topics such as electrical planning, BIM for HVAC systems, machine learning algorithms, and thermodynamics with practical applications in energy efficiency, waste management, and sustainable resource use. It also emphasizes professional skills like scientific writing, project planning, and formal communication, including job applications and emails, while guiding students through the process of selecting and completing a Bachelor's thesis with a focus on applying theoretical knowledge to real-world problems.

Semester 5		
Course	***ECTS Credits***	***Content***
Electrical planning	**2,5**	Electrical planning, Electrical installation technology and control cabinet planning, Documentation and acceptance
BIM system planning	**3**	Basics of Building Information Modeling, Modeling of HVAC systems and workflow, BIM Standardization and implementation
Neural networks & machine learning	**4**	Neurons and network architectures, Neural network training, Algorithms and models in machine learning, Evaluation, validation, optimization
Machine Learning Lab	**2**	Basics of machine learning, Data preparation and pre-processing, Introduction to machine learning libraries, Supervised learning, Model evaluation and optimization
Fluid mechanics and thermodynamics	**3**	Fundamentals of thermodynamics and heat transfer, Energy balance and system analysis, Fundamentals of fluid mechanics and flow analysis,
Environmental technology	**3**	Operational environmental protection, Sustainable and energy-efficient use of resources, Waste management
Business English 1	**1,5**	Basic e-mail writing (formal and informal register in e-mails), Recruitment and training (i.e.: job interview), Letter of application, CV
Scientific work	**1**	Scientific work as a process, Scientific work as a product
Bachelor thesis seminar	**1**	Choice of Bachelor thesis supervisor, Process-related, methodological and technical support and supervision by bachelor's thesis supervisor, Application Bachelor thesis topic, Bachelor thesis concept, Presentation Bachelor thesis topic
Internship 3	**6**	Transfer and application of teaching content, combination of theory and practice, Social behavior, Problem-solving ability
Project work 2	**3**	Topic selection and theoretical introduction to the selected topic, Project planning, Project implementation, Project documentation, Scientific paper, Project presentation
Total ECTS in the semester	**30**	

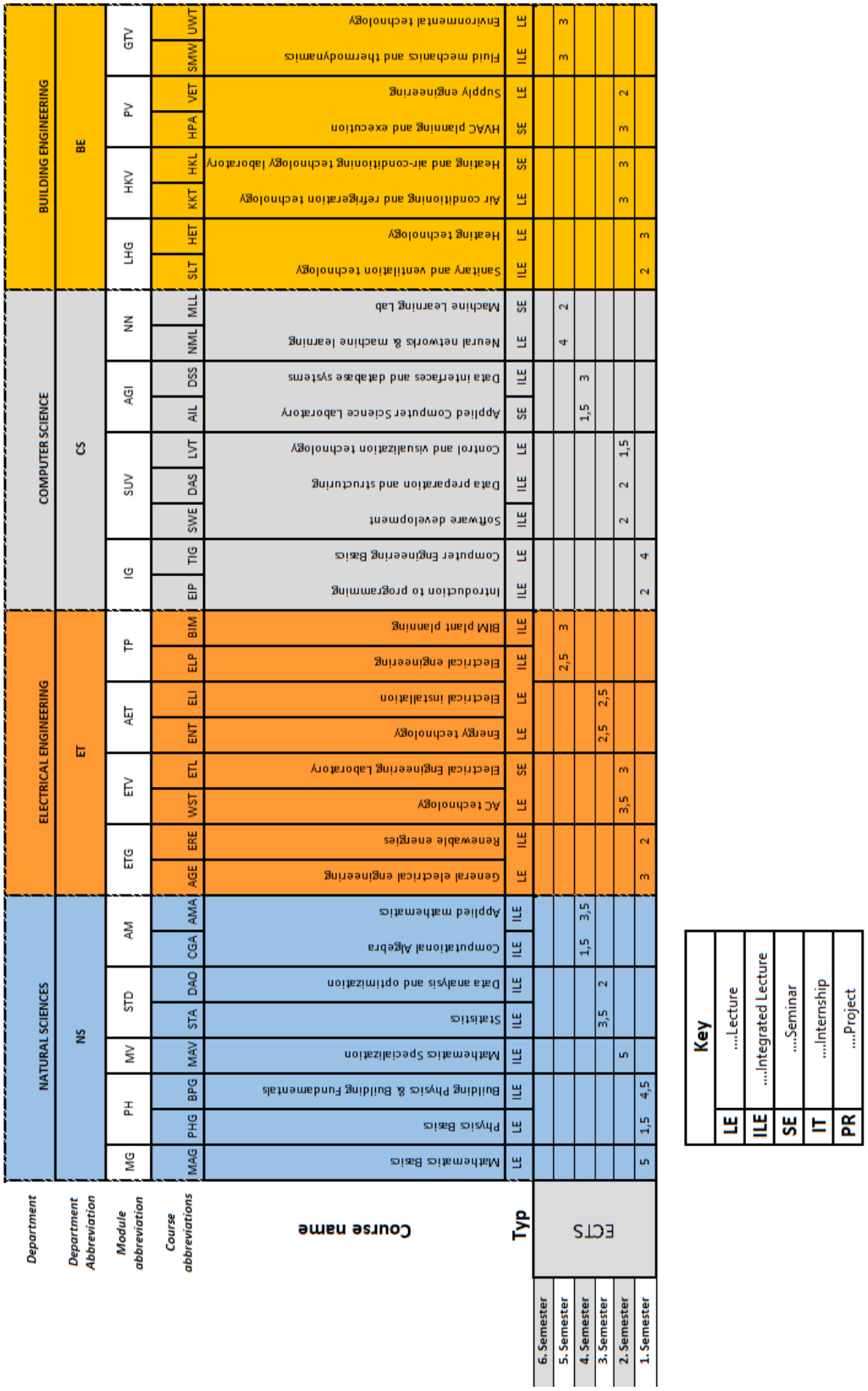
The focus in the sixth semester is on deepening the economic aspects as well as writing the Bachelor's thesis. The semester covers key technical areas such as modeling techniques for building and energy systems, network architecture, cybersecurity, and maintenance technologies, along with fundamental business skills in accounting,

corporate law, and corporate sustainability. Additionally, it emphasizes professional communication, social responsibility, and the practical application of knowledge through project work, including the supervision and execution of a Bachelor's thesis that integrates theory and practice.

Semester 6		
Course	*ECTS Credits*	*Content*
Integral planning and simulation	**2**	Modeling and modeling terms, Overview of relevant modeling languages, Agent-based programming, Equation-based modeling, System Engineering, Application and utilization of modeling in the building and energy sector
Networked systems and IT security	**2**	Network architecture, Network monitoring, Planning of network infrastructures, Network protocols, services and applications, Perspectives on cyber security, Development trend, Computer security and network security
Maintenance, servicing and operational optimization	**1,5**	Inspection methods and technologies, Maintenance and repair, Calibration, Spare parts management and safety
Profitability calculation	**2,5**	Fundamentals of business accounting, Basics of cost accounting, Fundamentals of investment accounting, Basics of operational financing
Corporate and company law	**1**	Fundamentals of corporate law, Criteria for the appropriate choice of legal form, Representation of the entrepreneur (proxy, general power of attorney, power of attorney, power of attorney), Fundamentals of company law, Company publicity (company register), Detailed presentation of the most important company forms (corporations and partnerships)
Corporate sustainability	**2,5**	Basics of “Corporate sustainability”, Stakeholder implementation, Assumption of corporate responsibility, Focus on social responsibility, Strategic corporate sustainability, Sustainability communication
Business English 2	**1,5**	Making orders and complaints (on the phone and in writing), Negotiating a Business Concept, Telephoning (Leaving messages, Making appointments)
Internship 4	**6**	Transfer and application of teaching content, combination of theory and practice, social behavior, Problem-solving ability
Compulsory elective subject specialization	**5**	Computer-aided data analysis or process control technology for building automation
Bachelor thesis	**5**	Process-related, methodological and technical support and supervision by Bachelor's thesis supervisor, Theory part Bachelor thesis, Practical part Bachelor thesis, Bachelor thesis, Execution of Bachelor thesis, Procedure Bachelor thesis
Bachelor examination	**1**	-
Total ECTS in the semester	**30**	

6. CURRICULUM OVERVIEW

The following chapter provides an overview of the complete curriculum over the 6 semesters. At the top level are the subject areas which contain different modules. Most modules contain several or at least one course which in total contain 7-8 ECTs. The respective course type, including the ECTs it contains, can be found below the course title.


Department
Department Abbreviation
Module abbreviation
Course abbreviations
Course name
Typ
ECTS
6. Semester
5. Semester
4. Semester
3. Semester
2. Semester
1. Semester
NATURAL SCIENCES
ELECTRICAL ENGINEERING
COMPUTER SCIENCE
BUILDING ENGINEERING
NS
ET
CS
BE
MG
PH
MV
STD
AM
ETG
ETV
AET
TP
IG
SUV
AGI
NN
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SWE
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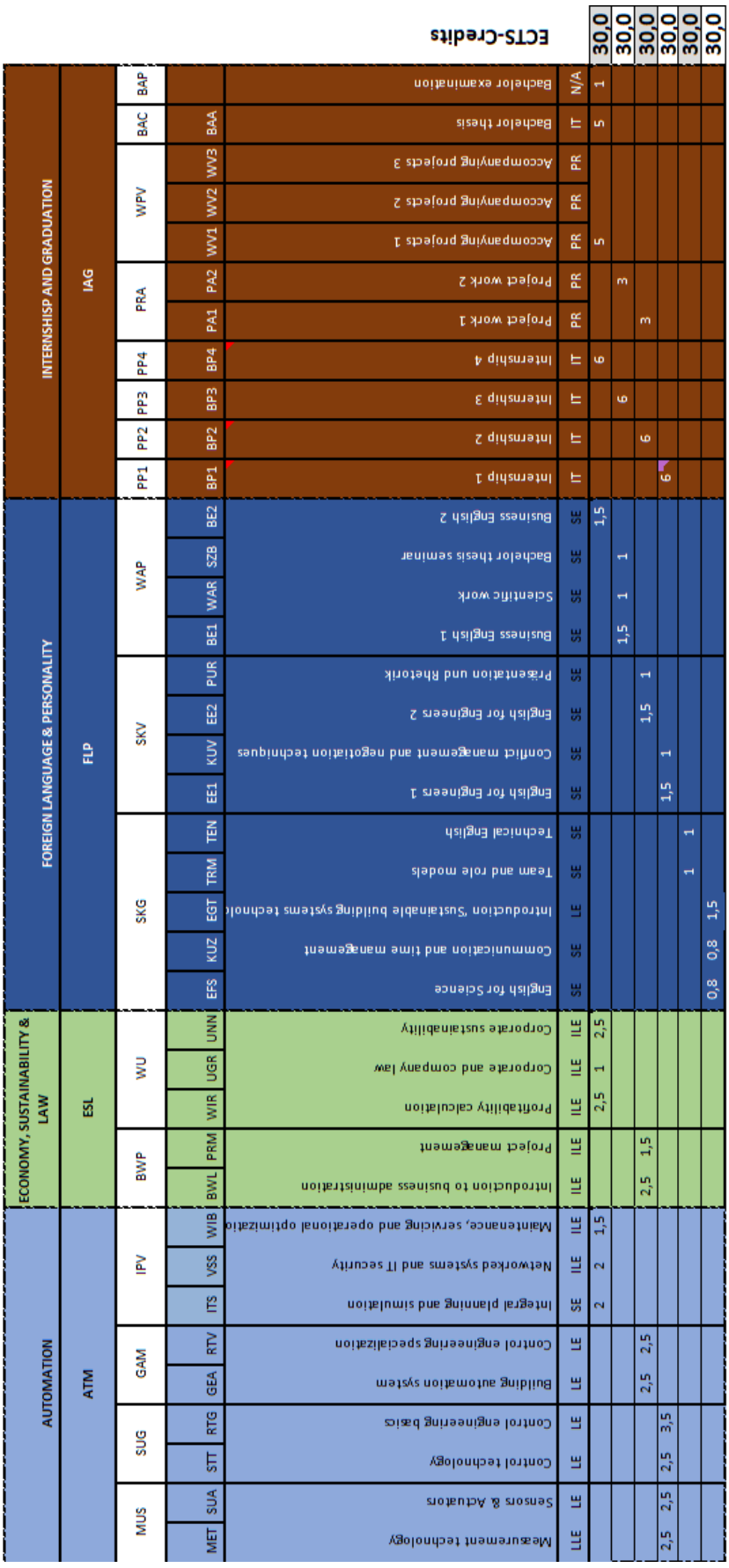
LVT
AIL
DSS
NML
MLL
SLT
HET
KKT
HKL
HPA
VET
SMW
UWT
Mathematics Basics
Physics Basics
Building Physics & Building Fundamentals
Mathematics Specialization
Statistics
Data analysis and optimization
Computational Algebra
Applied mathematics
General electrical engineering
Renewable energies
AC technology
Electrical Engineering Laboratory
Energy technology
Electrical installation
Electrical engineering
BIM plant planning
Introduction to programming
Computer Engineering Basics
Software development
Data preparation and structuring
Control and visualization technology
Applied Computer Science Laboratory
Data interfaces and database systems
Neural networks & machine learning
Machine Learning Lab
Sanitary and ventilation technology
Heating technology
Air conditioning and refrigeration technology
Heating and air-conditioning technology laboratory
HVAC planning and execution
Supply engineering
Fluid mechanics and thermodynamics
Environmental technology
LE
ILE
SE
IT
PR
Key
....Lecture
....Integrated Lecture
....Seminar
....Internship
....Project


AUTOMATION
ECONOMY, SUSTAINABILITY & LAW
FOREIGN LANGUAGE & PERSONALITY
INTERNSHIP AND GRADUATION
ATM
ESL
FLP
IAG
MUS
SUG
GAM
IPV
BWP
WU
SKG
SKV
WAP
WPV
PRA
PP4
PP3
PP2
PP1
BAC
BAP
ECTS-Credits
30,0
Bachelor examination
Bachelor thesis
Accompanying projects 3
Accompanying projects 2
Accompanying projects 1
Project work 2
Project work 1
Internship 4
Internship 3
Internship 2
Internship 1
Business English 2
Bachelor thesis seminar
Scientific work
Business English 1
Presentation und Rhetorik
English for Engineers 2
Conflict management and negotiation techniques
English for Engineers 1
Technical English
Team and role models
Introduction "Sustainable building systems techno
Communication and time management
English for Science
Corporate sustainability
Corporate and company law
Profitability calculation
Project management
Introduction to business administration
Maintenance, servicing and operational optimizatio
Networked systems and IT security
Integral planning and simulation
Control engineering specialization
Building automation system
Control engineering basics
Control technology
Sensors & Actuators
Measurement technology
Key
LE ....Lecture
ILE ....Integrated Lecture
SE ....Seminar
IT ....Internship
PR ....Project

7. CONCLUSIO AND OUTLOOK

The Bachelor's degree program Sustainable Building Systems Technology offers a comprehensive and forward-thinking education that addresses the urgent need for resource-efficient, sustainable solutions in the building sector. The program focuses on optimizing energy supply and consumption, integrating renewable technologies, and improving heating, air conditioning, and water usage systems, all of which are essential for creating environmentally sustainable buildings. With its interdisciplinary curriculum, the program blends technical skills in building technology, automation, and digitization with a solid foundation in economics, communication, and project management. This holistic approach not only equips graduates with the expertise to design and manage complex building systems but also prepares them to adapt to the rapid changes in the field, particularly in the context of climate change.

Graduates emerge with both technical proficiency and interdisciplinary competencies, making them highly versatile in addressing challenges like energy efficiency, automation, and digitization in building systems. The program's unique collaboration with industry partners ensures that students gain practical, hands-on experience in real-world scenarios, reinforcing their theoretical knowledge. Additionally, the inclusion of modules on renewable energy, energy management, and load flow optimization positions graduates to make meaningful contributions to the global sustainability agenda, aligning with the shift towards a greener, more energy-efficient built environment.

Looking to the future, the demand for professionals skilled in Sustainable Building Systems Technology will continue to rise as the world confronts the pressing challenges of climate change and resource scarcity. Graduates of this program are well-positioned to become leaders in the transition to sustainable building practices, particularly as technological innovations in digitization, automation, and energy management advance. The program's strong emphasis on these emerging technologies ensures that graduates will be at the forefront of designing and managing smart buildings, capable of integrating renewable energy sources, optimizing energy use, and reducing environmental impact.

The part-time study model is particularly advantageous for working professionals, enabling them to continue gaining valuable industry experience while simultaneously advancing their education. This model not only helps address the skills shortage in the building sector but also allows for the seamless application of newly acquired knowledge to ongoing projects, accelerating the implementation of sustainable practices in real-world settings.

Moreover, the program's close collaboration with industry and research partners ensures that its curriculum remains aligned with current and future market needs. As the building sector continues to evolve with advancements in energy analytics, smart automation, and sustainable technologies, the program's graduates will be equipped with the skills to meet these challenges head-on. The integration of cutting-edge research

from the EAS Lab (Energy Analytics and Solution Lab) and the involvement of industry leaders in curriculum development further enhance the program's relevance and ensure that students graduate with up-to-date, applicable expertise.

In the long term, as global priorities shift towards sustainability and decarbonization, graduates of the Sustainable Building Systems Technology program will play a pivotal role in driving the energy transition in the building industry. Their knowledge of digital and renewable energy solutions, combined with their ability to navigate interdisciplinary challenges, will position them as key contributors to the creation of energy-efficient, resilient buildings that meet the needs of a rapidly changing world.

Evaluation Concept[2]

Questionnaire concept for graduates of the bachelor degree program "Sustainable Building System Technology" at CAMPUS 02 University of Applied Sciences.

As a University of Applied Sciences, it is very important to us to improve the level of information about our graduates.
We are constantly striving to optimize our range of degree programs and you as a graduate can make a significant contribution to this with your opinion.
Please support us and take about 10 minutes to answer the following questions.
Your data will of course be treated confidentially.
Thank you very much!

1. Think back to your completed degree program: How satisfied were you with the aspects listed?

	Very good	Good	Satis-factory	Suffi-cient	Not suffi-cient	Dont know/No answer
Overall organization of the course	□	□	□	□	□	□
Selection of study contents and subjects	□	□	□	□	□	□
Combination of theory and practice in the degree program	□	□	□	□	□	□
Teaching of soft skills	□	□	□	□	□	□
Teaching of language skills	□	□	□	□	□	□
Interdisciplinary thinking in contexts	□	□	□	□	□	□
Entrepreneurial thinking/economic aware-ness	□	□	□	□	□	□
Enabling career change and advance-ment	□	□	□	□	□	□
Building a network among colleagues	□	□	□	□	□	□
Enabling or encouraging professional in-dependence	□	□	□	□	□	□

2. If you think back to the contents of your degree program or subjects and consider them in the light of your previous professional experience:

2a. In your opinion, which program contents or subjects are overrepresented in the curricu-lum?

.....

2b. In your opinion, which study contents or subjects should be offered more intensively or included in the curriculum?

.....

[2] Prepared by Camus 02, Graz

3. Please tick up to 3 reasons why you have decided in favor of a (further) academic education!

Career change or promotion opportunities	□
Enabling or encouraging self-employment	□
Better pay	□
Acquisition of a (further) academic degree	□
Out of personal interest in the subject	□
Completed training in my chosen specialism	□
Other, namely	□

4. Please tick the most important reason why you have decided to study (further) at a University of Applied Sciences!

High practical relevance	□
Modern infrastructure, modern equipment	□
Fixed timetable	□
Supervision of students in small groups	□
Good job opportunities after graduation	□
Possibility of part-time study	□
Other, namely	□

5. Please tick up to 3 reasons why you have chosen CAMPUS 02 University of Applied Sciences!

Your chosen specialization is only offered here	□
Possibility of part-time study	□
Professional communication of CAMPUS 02 University of Applied Sciences (e.g. web, fairs, brochures, information evenings, etc.)	□
Recommendation from friends, acquaintances, work colleagues etc.	□
Advice from superiors, HR managers	□
Good networking with the business world	□
Network of colleagues and teachers	□
Geographical proximity	□
Location of the university in the countryside	□
Modern infrastructure, modern equipment	□
Positive experiences with a previous Bachelor's program	□
Good atmosphere in the degree program	□
Responsiveness to suggestions/needs during the degree program	□
Other, namely	□

6. From today's perspective, would you generally choose to study at a University of Applied Sciences again?

Yes, definitely	□
Rather yes	□
Rather no	□

No, definitely not	□
Don't know/no answer	□

If rather no or no, please give reasons:

.....

7. From today's perspective, would you choose the degree program "Sustainable Building System Technology" again?

Yes, definitely	□
Rather yes	□
Rather no	□
No, definitely not	□
Don't know/no answer	□

If rather no or no, please give reasons:

.....

8. From your point of view, how would you rate the current chances of graduates of the degree program "Sustainable Building System Technology" on the labour market?

Very good	□
Good	□
Satisfactory	□
Sufficient	□
Not sufficient	□
Don't know/no answer	□

9. From your point of view, how do you assess the future chances of graduates of the degree program on the labor market? In your opinion, will they ....

Rise sharply	□
Increase moderately	□
Stay the same	□
Decrease	□
Fall sharply	□
Don't know/no answer	□

10. What was your professional position before you started the degree program? (multiple answers possible)

Management position with personnel responsibility	□
Management position without personnel responsibility	□
Employed without management responsibility	□
Self-employed/freelance activity	□
(Co-)owner of a company	□
I started studying immediately after graduating from high school or completing my bachelor's degree (Continue with question 17)	□
Without employment (Continue with question 17)	□
Other, namely	□

.....	

11. Are you still working in the same company as when you completed the degree program?

Yes	□
No	□

12. How well were your studies and career compatible?

Very good	□
Good	□
Satisfactory	□
Sufficient	□
Not sufficient	□

13. In what way did your company support you during your studies? (multiple answers possible)

My company supported my studies financially.	□
My company supported me by giving me time off (e.g. educational leave, flexible working hours)	□
My company did not like the fact that I was studying.	□
My company was not allowed to know about my studies.	□
Don't know/no answer	□
Other, namely	□

14. How would you rate your own professional development as a result of the completed degree program "Sustainable Building System Technology"?

	Significantly increased or improved	**Increased or improved**	**Remained the same**	**Decreased or worsened**	**Significantly decreased or worsened**	**Don't know/No answer**
Position in the hierarchy	□	□	□	□	□	□
Diversity of the area of responsibility	□	□	□	□	□	□
Remuneration	□	□	□	□	□	□
Area of responsibility	□	□	□	□	□	□
Number of subordinate employees	□	□	□	□	□	□
Confidence of my superior in my knowledge/skills/knowledge	□	□	□	□	□	□
Other, namely	□	□	□	□	□	□

....						

15. What professional position do you now hold after completing the degree program? (multiple answers possible)

Management position with personnel responsibility	□
Management position without personnel responsibility	□
Employed without management responsibility	□
Self-employed/freelance activity	□
(Co-)owner of a company	□
Without employment	□
Other, namely	□

16. The next block of questions is about your application experience. Please tick the appropriate box.

I applied for my first or another job during or after my degree (continue to question 19)	□
I took on a new professional role in my company during or after my degree programme (continue to question 23)	□
I did not have any job application experience during or after my degree programme (go to question 24)	□

17. At what point did you try to find your first/new job?

Before starting the completed program	□
Early on during the completed degree program	□
In the last semester	□
Immediately after graduation	□
Not yet	□

18. How many applications have you submitted?

Up to 6	□
Up to 10	□
Up to 20	□
Up to 40	□
More than 40	□

19. How many interviews have you been invited to?

None yet	□

Up to 5	□
Up to 10	□
More than 10	□

20. How long did it take from the start of your search to the start of your first/new job?

Up to 2 months	□
Up to 4 months	□
Up to 6 months	□
More than 6 months	□

21. Please tick the 3 most important ways in which you found your first/new job.

Application for advertised positions	□
Contacts with the employer from your studies (e.g. internship, Bachelor's thesis, Master's thesis)	□
Blind application	□
Trade fairs/university job fairs	□
Joined the company from friends/relatives/acquaintances/study colleagues	□
Other personal relationships/contacts	□
Employer has offered a position on their own initiative	□
Contact via lecturers	□
Recruitment consultants	□
Network (LinkedIn, XING etc.)	□
Job exchange on the internet	□
Other, namely	□

22. Please tick the 3 most important factors for your successful career entry, career change or the successful completion of your new task.

Chosen field of study	□
My personality	□
Subject focus/specialization during your studies/topic of your thesis	□
Personality-building specializations during your studies	□
Versatility of qualifications	□
Grades in the final examination or in the course of the degree program	□
Professional activity before the degree program/previous experience	□
Foreign language skills	□
Experience abroad	□
Personal relationships	□

23. How satisfied are you overall with your current professional situation?

Very good	□
Good	□

Satisfactory	□
Sufficient	□
Not sufficient	□

24. How satisfied are you overall with your completed degree program?

Very good	□
Good	□
Satisfactory	□
Sufficient	□
Not sufficient	□

If "Sufficient" or "Not sufficient", please give reasons for your answer:

.....

25. How likely is it that you would recommend the degree program "Sustainable Building System Technology" to your relatives, friends or colleagues? Please answer on a scale from 1 to 10 – 1 means "extremely unlikely" and 10 means "extremely likely".

1	2	3	4	5	6	7	8	9	10
□	□	□	□	□	□	□	□	□	□

25a. What is the main reason for the rating you just gave?

.....

26. How do you rate the image of the degree programs at CAMPUS 02 University of Applied Sciences among HR managers?

Very good	□
Good	□
Satisfactory	□
Sufficient	□
Not sufficient	□
HR managers do not have a clear image	□
Don't know/no answer	□

27. What recommendation would you like to give CAMPUS 02 University of Applied Sciences for its further development?

.....
.....
.....
.....

28. Please tell us some more statistical data about you or your company

28a. Gender

Male	□
Female	□
Diverse	□

28b. Age

under 25 years	□
25 - 30 years	□
30 - 35 years	□
35 - 40 years	□
40 years and over	□

28c. Number of employees in the company

None	□
1-5	□
6-15	□
16-30	□
31-50	□
51-70	□
71-100	□
101-200	□
201-500	□
Over 500	□
Am currently without employment	□

Dear graduate!

On behalf of CAMPUS 02 University of Applied Sciences, we would like to thank you very much for participating in this survey. Thank you very much!

Next steps and future implementation[3]

The following statement describes the procedure of a study program accreditation procedure, which measures and activities have been implemented so far, in which areas hurdles were encountered and which tasks could not be implemented as a result, and finally the next planned steps are discussed.

1. Accreditation procedures for universities of applied sciences (UAS) in Austria

The accreditation procedure for universities of applied sciences (UAS) in Austria is a comprehensive process designed to ensure that study programs and institutions meet the high-quality standards of the Austrian higher education landscape. Accreditation is carried out by the Agency for Quality Assurance and Accreditation Austria (AQ Austria).

2. Preliminary application in general

The first short application serves as a preliminary application and is an initial assessment of whether the planned degree program fulfils the basic requirements and objectives of the UAS sector. This preliminary examination helps to identify possible weaknesses at an early stage and thus increase the chances of success in the full accreditation procedure.

In terms of content, the short application already contains a rough concept of the degree program, such as the study profile, target groups and professional fields of graduates. AQ Austria reviews these aspects in order to make an initial assessment. A positively assessed short application is therefore an important preliminary stage for the submission of the comprehensive main application.

3. Full application form in general

After positive certification of the pre-application the full application follows as listed below:

3.1 Application

The accreditation of study programs is carried out by means of an application. Every new degree program must be accredited before it can be implemented.

3.2 Assessment and evaluation

AQ Austria organizes an external assessment of the application. An assessment committee of independent experts is appointed to review the application on the basis of defined criteria:

- Quality standards of teaching and research

[3] Prepared by Campus 02 Fachhochschule der Wirtschaft GMBH, Austria

- Qualifications of the teaching staff
- Resources (infrastructure, funding)
- Professional qualification of graduates
- Compatibility with the objectives of the university of applied sciences sector

3.3 Statement of the institution

Once the assessment has been completed, the applicant higher education institution is given the opportunity to submit a statement on the results and to make any changes or improvements.

3.4 Decision by the Accreditation Council

The Accreditation Council of AQ Austria decides on the basis of the evaluation report and the statement of the higher education institution whether accreditation is granted or not. The decision can be positive, conditionally positive or negative.

3.5 Publication of the decision

The accreditation decision is made public, and the university can officially call itself an “accredited university of applied sciences” if it receives accreditation.

3.6 Temporary accreditation and reaccreditation

Accreditation is usually limited in time (usually for 5 to 7 years). Afterwards, reaccreditation must take place, in which the university must once again prove its quality.

3.7 Continuous quality management

An accredited university of applied sciences is obliged to operate an internal quality management system and to implement continuous improvements. AQ Austria carries out regular reviews to ensure that the quality standards are maintained in the long term.

- Objectives of the accreditation procedure:
- Ensuring the quality of study programs
- Promoting transparency in the higher education system
- Protection of students by guaranteeing a high-quality education
- Promoting application-orientated education in close cooperation with industry and practice

The accreditation procedure for universities of applied sciences in Austria is therefore a multi-stage process that serves to ensure and continuously develop the high quality of education at universities of applied sciences.

The following statement describes the specific effects of this procedure on the submission and implementation of the study program developed in the 3-Loe project during the project period.

4. Steps taken and measures implemented to date in the course of the 3LoE-project

The preliminary application was derived from the established curriculum structure, formulated in detail, and subsequently submitted; however, it was not approved during the initial submission. This is a common process as applications often do not receive immediate approval and must typically go through several approval procedures before a positive decision is reached.

Nevertheless, work on the full application proceeded simultaneously as preparation for the comprehensive submission. In addition to the extensive document that will be submitted in its final form to AQ Austria, the work primarily included entering all relevant information about the study program into the internal application management system. This system maps out the entire structure of the study program, assigns all subject areas, describes each module, and provides detailed information on each individual course.

The concept, development, and complete structure of the finalized study program are comprehensively presented in the document "3LoE - PP15 HS02 - WP5 A6.1 - Development of Dual Bachelor Program 'Sustainable Building Systems Technology'." Likewise, the corresponding individual evaluation concept for the program was created and submitted on time.

5. Tasks that could not be carried out so far in the course of the 3LoE-project

Due to the fact that the preliminary application was not approved during the initial submission, the further process chain of accreditation could not be initiated. However, this means that the study program could neither be implemented nor rolled out.

6. Next steps and future objectives regarding the bachelor’s degree program

Regardless of the fact that the preliminary application was not approved in the first instance, the re-submission in 2025 and the successful accreditation and rollout of the bachelor’s program Sustainable Building Systems Technology in the future is an integral part of the strategic planning of the department. Due to the thematic focus of the curriculum, in addition to the classic disciplines of automation technology, there will be an expanded emphasis on HVAC (Heating, Ventilation, Air Conditioning) and building systems technology, as well as their interoperability.