Move Forward
VIA University College

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Curriculum
Programme section

Bachelor of Global Business Engineering

Applicable to students enrolled in August 2021.
(transition for students enrolled in 2018, 2019 & 2020)

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Introduction

In accordance with the Executive Order on Bachelor of Engineering, the purpose of Bachelor of Engineering is to qualify the students to carry out the following professional functions nationally and Internalationally:

- Transpose technical research results as well as scientific and technical knowledge to practical use in development tasks and in solving technical problems
- Critically acquire new knowledge within relevant engineering areas
- Independently solve common engineering tasks
- Plan, implement and manage technical and technological facilities, including being able to involve social, economic, environmental and occupational health consequences in the solution of technical problems
- Participate in collaborative and managerial functions and contexts at a qualified level with people who have different educational, linguistic and cultural backgrounds

In addition, the education must qualify students to participate in further studies.

VIA Engineering programmes work on the basis of a common graduate profile. The graduate profile is a common profile for all VIA Engineers. The graduate profile is to be combined with the identity of the specific engineering programme.

At VIA Engineering, we are practice-oriented, project-oriented and world-focused. This is put into practice in the form of qualified new graduates obtained through targeted teaching, relevant research and development, as well as collaboration and ongoing dialogue with the business community. The programmes must qualify graduates to handle practical and development-oriented business functions.

Programmes in English as well as admission of Internalational students are hallmarks of our engineering programmes. This profile creates a unique opportunity to educate students who can act in a Danish context in an increasingly global market. Our lecturers have vast and solid practical experience and know how to anchor theory in practice through lab work, company visits and projects for and in collaboration with companies.

1 Identity of the programme

VIA Global Business Engineering (GBE) focuses on applied science and technology in a unique combination with economics and marketing, as well as languages and culture. The hallmark of the programme is the Internalational focus and the inter-disciplinary skills, which will make the GBE graduate attractive to a wide range of companies.

GBE graduates are qualified to:

- Operate primarily in the industrial market, especially within the fields of mechanical engineering and software engineering.
- Fulfil managerial positions within design and implementation of technical solutions, as well as within marketing and sales in Denmark and abroad.
- Obtain positions, e.g. as project managers, export managers, product managers or marketing coordinators.
- Work independently as well as in teams with members from different educational and cultural backgrounds.
- Optionally continue their studies to achieve a master's degree.

The objectives of the programme are achieved primarily through:

- Interaction between theory and practice with focus on **business**, **engineering**, and **culture**. Through the **project work**, emphasis is also on developing the student's professional, methodological, communicative and personal skills.
- Providing an Internalational study environment, with all courses offered and taught in English for Danish and Internalational students, with the possibility to carry out parts of the programme abroad
- Active utilisation of the student's **Internalship** as a mean to exchange knowledge and experience between the university college and the industry.

2 Graduate profile for VIA Engineers

Purpose
The newly graduated VIA engineer works problem-oriented, project- and team-based and contributes to advising, developing, inventing and quality-assuring products and solutions. The VIA engineer creates innovative, digital, sustainable and workable solutions to and for current and future societal and engineering challenges worldwide.

Skills
VIA Engineering educate holistic-thinking engineers who, through societal insight and personal development, can exploit the full potential of technology. Therefore, the skills of the VIA engineer range from highly specialised engineering skills to personal skills and the skills of the outside world.

Professional engineering skills
- Masters and applies – with critical reflection – highly specialised engineering knowledge.
- Works challenge-driven, innovative and problem-oriented when developing engineering results.
- Integrates engineering and scientific knowledge, skills and methods in solving engineering challenges.
- Designs, plans, simulates, manages, implements and evaluates engineering solutions and products using digital and technological tools.
- Implements and operates solutions that match engineering needs within the industry.

Organisational skills

- Organises and manages projects and processes based on both risk assessment and market and business understanding.
- Collaborates inter-professionally with a global view and respect for the organisation, culture and methods of businesses and stakeholders.
- Involves knowledge of sustainability and circular economy in the development and implementation of new solutions.

Personal skills

- Works consistently with a curious and innovative mindset and seeks out, critically acquires and brings new knowledge into play throughout life.
- Communicates effectively and collaborates professionally with colleagues and people of different educational and cultural backgrounds.

3 Teaching and working methods

The engineering programme's priority focus areas within Digitalisation, Sustainability and Innovation and Entrepreneurship are integrated into relevant courses, so that together they constitute learning streams for all three areas.

Active and practice-oriented learning is supported by:

- Dialogue-based teaching with a high degree of active participation from students.
- Lectures in subjects where there is a large proportion of knowledge transfer. Lectures are usually combined with practice sessions with a student tutor.
- Project work and problem-oriented learning (PBL) are an essential part of the teaching, as the academic elements of the education programme are integrated into application-oriented engineering projects with emphasis on methodological problem solving.
- Projects being carried out in groups within the programme and in an interdisciplinary collaboration with other engineering programmes.
- Collaborating with research environments and businesses in connection with the implementation of the teaching.
- Offering an International study environment, where parts of the study can be completed abroad and where several courses are held in English for Danish and foreign students alike.
- The student's engineering Internship being actively used to bring about the exchange of knowledge and experiences between VIA and the profession.

Application- and practice-oriented skills are primarily achieved by utilising VIA's facilities within laboratories, manufacturing workshops and library.

Teaching can be physical, online or located at another campus. There may also be projects that are done together between two locations, ie. here the project work will then be online. In addition, there may be subjects where you partially participate online / transmitted with the offer in either Horsens or Aarhus.

4 Structure and content

The programme is organised as a full-time higher education. Science and technology make up for minimum 50 percent of the study programme. Business and Communication courses make up maximum the remaining 50 percent of the programme. Teaching is structured around class tutorials, assignments, lab exercises and workshop practice. Classes are small in order to allow group discussions and provide more individualised attention. Focus is on active student-centered learning to develop your critical thinking and interpersonal skills. Theory taught in classroom sessions is applied in problem-based projects. This prepares the student for the challenges after graduation.

After completing the 2nd semester, the GBE students must choose either a software engineering specialisation or a mechanical engineering specialisation. The programme structure and progression will be as indicated in the two tables for GBE-Software Engineering and GBE-Mechanical Engineering, respectively on the next page.

Electives and specializations are created to the extent that there are sufficient students enrolled in the elective or specialization.

The official duration of the degree program is 4½ years, divided into 9 semesters of 30 ECTS, corresponding to 270 ECTS points in total.

The scope of each course or project is documented in the form of ECTS points (European Credit Transfer System). 1 ECTS point corresponds to a workload of 27.5 hours for a student, an academic year of 60 ECTS thus corresponds to 1,650 hours of work for the student.

New students are admitted in August every year.

The study includes:

- Compulsory courses and projects
- Elective courses
- Internship
- Bachelor project
- Workshops

A semester consists of 3-5 courses, which are delimited courses. A course's scope can range from 5 to 10 ECTS points, and a project's scope from 5 to 20 ECTS points.

The purpose, scope, learning objectives and exams of courses are described in this curriculum. For a detailed and complete description of the individual courses, please refer to the course descriptions in force at any given time, which are available on VIA's website and on VIA's Studynet.

There are 4 workshops associated with each of the engineering specialization programmes. Two of which are the same for the specialization.

The programme is structured as illustrated below:

Specialization within Software Engineering Technology:

Semester Theme	Course 5 ECTS	Course 5 ECTS	Course 5 ECTS	Course/ Project 5 ECTS	Project 5 ECTS	Project 5 ECTS
9. semester *Bachelor project*	**Elective**	**Elective**	**BPR1** Bachelor project			
8. semester *Internalship*	**INP1** Engineering Internship					
7. semester *Sustainable Product Development*	**Elective**	**MST1** Management and Strategy	**BUI1** Business Intelligence	**DNP1** .NET Internalet Technology	**SEP7** Semester Project	
6. semester	**PRM1** Project Mana-gement	**WEB2** Web Develop-ment 2	**DAI1** Data Analytics Infrastructure	**SWE1** Software Engineering	**SEP6** Semester Project	
5. semester *Study Abroad*	**Elective**	**Elective**	WEB1 Web develop-ment 1	**ERP1** ERP systems	**SEP5** Semester Project	
4. semester *Cross Discipli-nary work*	**DAT1** Data Analysis	**ECE1** Economics for Engineers	**DIG2** Digitalisation & Industry 4.0	**DBS1** Database Systems	**SEP4** Semester Project	
3. semester *Internalational Business Development*	**IBC1** Intercultural Business Communication	**MAM2** Global Marketing Management	**SDJ1** Software Development with Java		**SEP3** Semester Project	
2. semester *Design and technology*	**GBC2** Global Business Communication	**MAM1** Marketing Management	**MAT1** Mathematics	**EBM1** Engineering Basic: Mechanical design	**SEP2** Semester Project	
1. semester *Software technology*	**GBC1** Global Business Communication	**BUE1** Business Economics	**MATx** Engeneering Mathematics	**EBS1** Engineering Basic: Software technology	**DIG1** Digitalisation 1: CAD & micro controllers	**SEP1** Semester Project

Specialization within Mechanical Engineering Technology

Semester Theme	Course 5 ECTS	Course 5 ECTS	Course 5 ECTS	Course/ Project 5 ECTS	Project 5 ECTS	Project 5 ECTS
9. semester *Bachelor project*	**Elective**	**Elective**	**BPR1** Bachelorprojekt			
8. semester *Internalship*	**INP1** Engineering Internship					
7. semester *Sustainable Product Development*	**Elective**	**MST1** Management and Strategy	**MEM1** Machine elements and design	**ELE1** Electronics	**SEP7** Semester Project	
6. semester	**PRM1** Project Mana-gement	**TER1** Thermo dyna-mcs	**MEC2** Mechanics	**DYN1** Dynamics	**SEP6** Semester Project	
5. semester *Study Abroad*	**Elective**	**Elective**	**TDE1** Technical Design	**IDP1** Innovation & Product design	**SEP5** Semester Project	
4. semester *Cross Disciplinary work*	**DAT1** Data Analysis	**ECE1** Economics for Engineers	**DIG2** Digitalization 2: Industry 4.0	**PHY1** Physics	**SEP4** Semester Project	
3. semester *Internalational Business De-velopment*	**IBC1** Intercultural Business Communication	**MAM2** Global Marketing Management	**MEC1** Mechanics	**MMT1** Materials and Manufacturing Technologies	**SEP3** Semester Project	
2. semester *Design and technology*	**GBC2** Global Business Communication	**MAM1** Marketing Management	**MAT1** Mathematics	**EBM1** Engineering Basic: Mechanical design	**SEP2** Semester Project	
1. semester *Software technology*	**GBC1** Global Business Communication	**BUE1** Business Economics	**MATx** Noneering Mathematics	**EBS1** Engineering Basic: Software technology	**DIG1** Digitalisation 1: CAD & micro controllers	**SEP1** Semester Project

5 Compulsory elements of the education programme

All courses and projects in the first four semesters are compulsory and most of the courses will be relevant for the semester project. The purpose of the semester projects are to link the semester courses together combining science, business- and cultural understanding. Being able to create this overview and understanding is the main strength of a Global Business Engineer.

2.-7. semester all contain a semester project amounting to 10 ECTS. Included will be learning inputs in form of videos, online lectures, learning paths etc. amounting up to 2.5 ECTS. The amount of learning inputs can vary in the different semesters. The learning inputs are followed up by discussions initiated by the project supervisor.

The overall purpose of the semester project is to link the semester's courses together as a whole. Study technique. project management, methodology, scientific theory, research methodology and teamwork are introduced through the study in connection with the semester projects.

Each semester is themed, and knowledge and skills are acquired through the courses, while competencies are acquired and can be tested in the project – Problem-oriented learning. The theme for each semester is as follows:

1. semester: Software technology
2. semester: Design & technology
3. semester: International Business Development
4. semester: Working Cross Disciplinary
5. semester: Study Abroad
6. semester: Innovation & Entrepreneurship??
7. semester: Sustainable Product Development

5.1 1. semester: Software technology

Throughout the semester, the students are to acquire and develop good project management skills. The students must demonstrate their ability to work with cross-disciplinary challenges by implementing theoretical knowledge taught during the semester courses and thus working problem oriented.
More specifically for the first semester, the students must demonstrate their ability to design a proto type for a software solution and clarify if the R&D can be outsourced on the International market.

The purpose of the courses, ECTS and assessment:

Engineering Mathematics (MATx) – 5 ECTS	**Assessment:**
Students must gain general applied mathematical insight that contributes to an understanding of the crucial importance of mathematics in order to be able to describe, understand and communicate about scientific and technological issues. Through this, they must achieve a solid foundation to be able to commit and contribute actively, constructively and innovatively in their studies. Specifically, students must acquire competence to practice mathematical reasoning and logical thinking.	**Exam**: Individual written 4 hours. The final exam counts 100% **Assessor**: Internal **Prerequisites**: None **Reexam**: Can be oral
Business Economics (BUE) – 5 ECTS	
To obtain knowledge of how the firm profit is optimized under different market conditions and be able to analyse how external macroeconomic factors influence company's business environment.	**Exam**: Individual written 2 x 2 hours; each count 50% **Assessor**: Internal **Prerequisites**: None **Reexam**: As ordinary
Global Business Communication (GBC1) – 5 ECTS	

The purpose of this course is to develop the students' linguistic abilities and general communicative competences in English with special focus on communication in a professional context.	**Exam**: Individual written 4 hours. The final exam counts 100% **Assessor**: External **Prerequisites**: Yes **Reexam**: As ordinary
Digitalization (DIG1) – 5 ECTS	
The course aims to equip students with basic digital skills in engineering. The course is divided into two tracks: - 3D CAD and digital twins - Micro controllers and automation	**Exam**: Individual written 2 hours. The final exam counts 100% **Assessor**: Internal **Prerequisites**: Yes **Reexam**: As ordinary
Engineering Basic: Software Technology (EBS1) – 5 ECTS	
The main purpose of the course is to introduce the student to the field of software engineering; how basic computer program logic works and how to design and model an IT system.	**Exam**: Individual written 1 hour The final exam counts 100% **Assessor**: Internal **Prerequisites**: None **Reexam**: As ordinary
Semester Project (SEP1) – 5 ECTS	
The purpose is to give the students an introduction to problem-based learning through working with a specific problem. The problem includes three subject areas: Business Economics (BUE), Engineering Basics Software (EBS) and Global Business Communication (GBC1) within which areas a problem / case is worked on.	**Exam**: Written Group Project (and process) report and individual reflection report. The total hand-in counts 100% **Assessor**: Internal **Prerequisites**: Yes **Reexam**: As ordinary

The learning objectives of the courses (knowledge, skills and competencies) and further information about the form and conditions of the examination are given in Appendix 3.

Volume
30 ECTS credits

5.2 2. semester: Design & Technology

Throughout the semester, the students are to acquire and develop good project management skills. The students must demonstrate their ability to work with cross-disciplinary challenges by implementing theoretical knowledge taught during the semester courses.
More specifically in the second semester, the students must demonstrate their ability to design 3D CAD drawings for a prototype of a mechanical engineering product and subsequently make a marketing plan for the Danish market for the product. The students must plan to launch the product at an exhibition stand at an industrial fair.

Course purpose, ECTS and Evaluation:

Marketing Management (MAM1) – 5 ECTS	**Assessment**
The purpose of the course is to obtain wide market-oriented knowledge in marketing management and develop skills in order to be able to conduct a complete marketing plan for any business/organisation and product/service using relevant theories and models to identify, design and choose between alternative operational, tactical and strategic marketing possibilities.	**Exam**: Individual 4-hour written exam. The final exam counts 100% **Assessor**: External **Prerequisites**: Yes **Reexam**: Can be oral
Global Business Communication (GBC2) – 5 ECTS	
The purpose of this course is to further develop the students' linguistic abilities and general communicative competences in English focusing especially on communication in a professional context. Special focus will be on academic writing requirements in	**Exam**: Individual written 4 hours The final exam counts 100% **Assessor**: External

terms of syntax, coherence and structure, on technical English, report writing, presentations and information search on the semester theme. Focus will also be on developing oral communication based on business-related articles.	**Prerequisites**: Yes. **Reexam**: As ordinary
Engineering Basic: Mechanical Design (EBM1) – 5 ECTS	
The purpose of the course is to provide the student with basic knowledge of engineering dynamics. In addition, the student must become familiar with problem solving techniques and achieve a solid basis for further technical and science education.	**Exam**: Individual written 4 hours. The final exam counts 100% **Assessor**: Internal **Prerequisites**: Yes **Reexam**: Can be oral
Mathematics (MAT1) – 5 ECTS	
The course aims to strengthen and expand the student's basic skills in mathematics, especially in differential calculus.	**Exam**: Individual written 4 hours. The final exam counts 100% **Assessor**: External **Prerequisites**: None **Reexam**: As ordinary
Semester Project (SEP2) – 10 ECTS	
The purpose of the semester project is for the students to learn to apply professional competencies in a problem-based context. Solve engineering issues based on current and previous semesters' subjects. And demonstrate the ability to prioritize between issues and work in detail with selected issue (s) Problem-based learning through working with a specific problem. The problem includes three subject areas: Marketing Management (MAM1), Mechanical Engineering Basic (MEB) and Global Business Communication 2 (GBC2) within which areas a problem / case is worked on.	**Exam**: Group examination with individual assessment. 15 minutes per student. The final exam counts 100% **Assessor**: Internal **Prerequisites**: Yes **Re-exam**: As ordinary

The learning objectives of the courses (knowledge, skills and competencies) and further information about the form and conditions of the examination are given in Appendix 3.

Volume
30 ECTS

5.3 3. semester: International Business Development

Throughout the semester, the students are to acquire and develop good project management skills. The students must demonstrate their ability to work with cross-disciplinary challenges by implementing theoretical knowledge taught during the semester courses.
More specifically in the third semester, students must prepare an International Marketing Plan for resp. a mechanical engineering and a software specialized solution. The students who have chosen machine direction must further demonstrate their ability to design 3D CAD drawings for the prototype of a mechanical engineering product where the students who have chosen software direction must demonstrate their ability to develop a single user system.

Kursernes formål, ECTS og Assessor:

Intercultural Business Communication (IBC1) – 5 ECTS	Assessment
The purpose of this course is to enable the students to interact successfully and competently with people from different cultures in their future professional capacities.	**Exam**: Individual oral 20 minutes. Preparation 20 min. **Assessor**: External **Prerequisites**: Yes **Reexam**: As ordinary

Global Marketing Management (MAM2) – 5 ECTS	
The overall purpose of this course is to enable students to device a global marketing strategy and prepare an international marketing plan for any product or service in any export market.	**Exam**: Individual written 4 hours. The final exam counts 100% **Assessor**: External **Prerequisites**: Yes **Reexam**: Can be oral
Software development with Java (SDJ1) – 10 ECTS	
The purpose of the course is to give the student the qualifications to understand core concepts in object-oriented programming, as well as the ability to implement smaller programs in Java based on UML class diagrams.	**Exam**: Individual oral 30 minutes The final exam counts 100% **Assessor**: External **Prerequisites**: Yes **Reexam**: As ordinary
Mechanics (MEC1) – 5 ECTS	
The course aims to provide the student with basic skills in statics and strength theory to be able to analyse and dimension products, machines and production equipment within the industrial field.	**Exam**: Individual oral 20 minutes. The final exam counts 100% **Assessor**: Internal **Prerequisites**: none **Reexam**: As ordinary
Materials and Technologies (MMT1) – 5 ECTS	
The main purpose of the course is to enable the student to choose relevant types of steel based on material properties and to select relevant manufacturing technologies.	**Exam**: Individual oral 25 minutes. The final exam counts 100% **Assessor**: Internal **Prerequisites**: None **Reexam**: As ordinary
Semester Project (SEP3) – 10 ECTS	
The purpose of the semester project is for the student to focus on learning in the chosen professional specialization (software or mechanical engineer) and put this in a global perspective with a focus on an Internationalization strategy.	**Exam**: Group examination with individual assessment. 15 minutes per student – maximum 1 hour per group. The final exam counts 100% **Assessor**: Internal **Prerequisites**: Yes **Reexam**: As ordinary

The learning objectives of the courses (knowledge, skills and competencies) and further information about the form and conditions of the examination are given in Appendix 3.

Volume
30 ECTS

5.4 4. semester: Working Cross Disciplinary

Throughout the semester, the students are to acquire and further develop good project management skills. The students must demonstrate their ability to work with cross-disciplinary challenges by implementing theoretical knowledge taught during the semester courses. More specifically for the fourth semester, the students must demonstrate their ability to design a cross-disciplinary, sustainable and profitable energy solution.

Kursernes formål, ECTS og Assessor:

Data Analysis (DAT1) – 5 ECTS	Assessment
The purpose of the course is to make data analysis application-oriented so that the student can complete and present relevant results from data analyzes. The student will work with statistical arithmetic, data storage technologies, data quality and various data analysis methods.	**Exam**: Individual written 2 hours. The final exam counts 100% **Assessor**: Internal **Prerequisites**: None **Reexam**: As ordinary

Digitalization (DIG2) – 5 ECTS	
The purpose is to provide the student with basic engineering digital competencies within the industry 4.0 area. The course is co-read across the sector to raise the quality of the digital foundation.	**Exam**: Individual oral 20 minutes. The final exam counts 100% **Assessor**: Internal **Prerequisites**: None **Reexam**: As ordinary
Economics for Engineers (ECE1) - 5 ECTS	
The main purpose of the course is to enable students to assess and present the financial consequences of a business case concerning investments in capital equipment and/or product / market development	**Exam**: Individual written 3 hours. The final exam counts 100% **Assessor**: External **Prerequisites**: None **Reexam**: Can be oral
Databasesystemer (DBS1) – 5 ECTS	
The course has two purposes. Firstly, students are to learn methods for designing, implementing and operating single-user relational databases. Secondly, students are to learn the main principles, architecture and technologies of a typical relational database management system (RDBMS).	**Exam**: Individual written 4 hours. The final exam counts 100% **Assessor**: External **Prerequisites**: Yes **Reexam**: Can be oral
Physics (PHY1) – 5 ECTS	
The purpose of the course is to provide the student with basic knowledge of thermodynamics and electricity. In addition, the student must become familiar with problem solving techniques and achieve a solid basis for further technical and science education.	**Exam**: Individual written 4 hours. The final exam counts 100% **Assessor**: External **Prerequisites**: Yes **Reexam**: Can be oral
Semester Project (SEP4) – 10 ECTS	
The main purpose of the semester project is to apply professional competencies in a problem-based context with a focus on interdisciplinary collaboration between software and mechanical engineering specializations. A common technical solution must be developed, after which the profitability of this must be assessed.	**Exam**: Group examination with individual assessment. 15 minutes per student – maximum 1 hour per group. The final exam counts 100% **Assessor**: Internal **Prerequisites**: Yes **Reexam**: As ordinary

The learning objectives of the courses (knowledge, skills and competencies) and further information about the form and conditions of the examination are given in Appendix 3.

Volume
30 ECTS

5.5 5. semester: Study Abroad

Throughout the semester, students must acquire and develop good project management skills. The students must demonstrate their ability to work with interdisciplinary challenges by implementing theoretical knowledge taught in the semester courses. More specifically in the sixth semester, the student must focus on and further improve his / her skills in the chosen specialization subjects as well as demonstrate the ability to study and work with the technical field, preferably in an international environment at a foreign educational institution.
Kursernes formål, ECTS og Assessor:

Web Development (WEB1) – 5 ECTS	
	Exam: **Assessor**: **Prerequisites**: **Reexam**:
ERP-Systems (ERP1) – 5 ECTS	

The purpose of the course is to introduce students to the main aspects of the design and implementation of ERP systems and SAP ABAP / 4 programming.	**Exam**: Individual oral 20 minutes. Exam counts 50% and mandatory course work counts 50% **Assessor**: Internal **Prerequisites**: Yes **Reexam**: As ordinary
Innovation and Design of Products (IDP1) – 5 ECTS	
The main purpose of the course is to strengthen student's acquaintance with engineering procedures within the development and assessment of mechanical products from both redesign and conceptual design perspectives. Human-centered design thinking, business assessment and innovation strategies will be of emphasis.	**Exam**: Group examination with individual assessment. **Assessor**: Internal **Prerequisites**: None **Reexam**: As ordinary
Technical Design (TDE1) – 5 ECTS	
The course aims to provide the student with knowledge and methods for outlining and illustrating machine constructions according to the applicable standardized rules.	**Exam**: Individual oral 20 minutes. **Assessor**: Internal **Prerequisites**: Yes **Reexam**: As ordinary Individual oral examination, 20 minutes
Semester Project (SEP5) – 10 ECTS	
The purpose of the course is for the student to learn to master the complex innovation process, starting by identifying new ideas, product / service or opportunities that create future growth and value for new and existing companies.	**Exam**: Group examination with individual assessment. 15 minutes per student – maximum 1 hour per group. The final exam counts 100% **Assessor**: External **Prerequisites**: Yes **Reexam**: As ordinary

The learning objectives of the courses (knowledge, skills and competencies) and further information about the form and conditions of the examination are given in Appendix 3.

Volume
30 ECTS

5.6 6. semester: Innovation % Entrepreneurship??

Throughout the semester, students must acquire and develop good project management skills. The students must demonstrate their ability to work interdisciplinary with innovation and entrepreneurship.
More specifically in the fifth semester, students must demonstrate their ability to design and develop an innovative product / service solution for a given company or organization within the industry.

Kursernes formål, ECTS og Assessor:

Project Management (PRM1) – 5 ECTS	**Assessment**
The purpose of the course is for the student to become familiar with the tools that can help the project manager to succeed in his/her work. The focus will be on how to organize a complex interdisciplinary project and use relevant tools to minimize the risk of failure.	**Exam**: Written hand-in (a group report counting 60% & an individual reflection counting 40%). **Assessor**: External **Prerequisites**: Yes. **Reexam**: As ordinary
Web Development 2 (WEB2) – 5 ECTS	**Assessment**

The purpose of this course is to provide the student with the knowledge, skills and competencies needed to utilize the tools, principles, patterns and best practices of Android development.	**Exam**: Individual oral 20 minutes. The final exam counts 100% **Assessor**: External **Prerequisites**: Yes **Reexam**: As ordinary
Data Analytics Infrastructure (DAI1)	
The course introduces the student to selected topics in the design and implementation of infrastructure to support data analytics. Within this area, the course will introduce students to different tools and techniques for data acquisition, cleansing and integration from different sources, data modelling for analytics and basic visualization.	**Exam**: Individual oral 20 minutes. The final exam counts 100% **Assessor**: External **Prerequisites**: Yes **Reexam**: As ordinary
Software Engineering (SWE1) – 5 ECTS	
The purpose is to qualify the student to apply software engineering concepts used to develop Object Oriented software. Structure the software development process by applying SCRUM and Unified Process to conduct analyse, Design and Test-descriptions to exemplify a final solution from a real-lift problem. This involves requirement capturing (Use Cases and non-functional requirements), analysis, domain models, interaction diagrams, design classes, design patterns and test-descriptions etc.	**Exam**: Individual oral 20 minutes. The final exam counts 100% **Assessor**: Internal **Prerequisites**: Yes **Reexam**: As ordinary
Dynamics (DYN1) – 5 ECTS	
The course aims to provide the student with basic skills in particle dynamics	**Exam**: Individual written 4 hours The final exam counts 100% **Assessor**: External **Prerequisites**: None **Reexam**: As ordinary
Mechanics (MEC2) – 5 ECTS	
The aim of the course is to enable the student to analyse stresses, strains and deformations in structures with the purpose of assessing a machine construction in relation to safety against permanent deformation and fracture.	**Exam**: Individual oral 20 minutes. The final exam counts 100% **Assessor**: Internal **Prerequisites**: Yes **Reexam**: As ordinary
Thermodynamics (TER1) – 5 ECTS	
The student will obtain knowledge of the basic theory within thermodynamics and be able to perform elementary thermal calculations. Incorporate energy aspect in mechanical projects and have a basic knowledge of energy specialisation.	**Exam**: Written 4 hours, Digitally submission Courses activities (2 Tests and 7 assignment) counts 30 % of the final evaluation, the final exam counts 70% **Assessor**: External **Prerequisites**: None **Reexam**: As ordinary
Semester project (SEP6) – 10 ECTS	
The main purpose of the project is to develop or further develop a product or concept via innovation processes and end up with both a technical solution and a bid for a business plan for this. In the project, emphasis must be placed on documentation of the product's sales relevance via thorough market research.	**Exam**: Group examination with individual assessment. 15 minutes per student – maximum 1 hour per group. The final exam counts 100% **Assessor**: External **Prerequisites**: Yes **Reexam**: As ordinary

The learning objectives of the courses (knowledge, skills and competencies) and further information about the form and conditions of the examination are given in Appendix 3.

Volume
30 ECTS

5.7 7. semester: Sustainable Product Development

Throughout the semester, the students are to fine tune their project management skills. The students must demonstrate their ability to work with cross-disciplinary challenges by implementing theoretical knowledge taught during the previous semester courses. More specifically for the seventh semester, are to prepare for their bachelor project comprising all three GBE elements – applied business, applied engineering and applied language and culture focusing on the UN 17 goals.

Kursernes formål, ECTS og Assessor:

(MST1) Strategy, Organization and Management (MST1) – 5 ECTS	**Assessment**
The purpose of this course is for the students to gain and apply knowledge on management and strategy theory, tools and planning processes in an organizational context.	**Exam**: 4 hours written exam **Assessor**: External **Prerequisites**: Yes **Reexam**: As ordinary
Business Intelligence (BUI1) – 5 ECTS	
The main purpose of the course is to equip the student to work with realistic data using professional business intelligence tools such as Microsoft SSIS, SSRS and SSAS	**Exam**: Individual oral 20 minutes The final exam counts 100%. **Assessor**: Internal **Prerequisites**: Yes **Reexam**: As ordinary
.NET Programming (DNP1) – 5 ECTS	
The purpose is to qualify the student to de-scribe and implement the basic concepts of the C# programming language and the .NET developer platform.	**Exam**: Individual written4 hours. The final exam counts 100%. **Assessor**: Internal **Prerequisites**: Yes **Reexam**: As ordinary
Machine Elements and Design of Machines (MEM1) – 5 ECTS	
To acquire methods and tools in machine elements, technical design and dynamically loaded shafts.	**Exam**: Oral group exam with individual assessment. 30 Minutes The final exam counts 100%. **Assessor**: External **Prerequisites**: Yes **Reexam**: As ordinary
Electrical Engieering (ELE1) – 5 ECTS	
The main purpose is to gain knowledge about electrical systems, electrical installations and to be able to calculate and select correct electric motors.	**Exam**: Individual oral 20 minutes The final exam counts 100%. **Assessor**: Internal **Prerequisites**: None **Reexam**: As ordinary
Semester Project (SEP7) – 10 ECTS	
To develop and practice cross-disciplinary Global Business Engineering competences within sustainable product development and entrepreneurship supporting the framework of the UN 17 Sustainable Development Goals	**Exam**: Group presentation and joint examination with individual assessment. 15 minutes per student – maximum 1 hour per group. The final exam counts 100% **Assessor**: Internal

	Prerequisites: Yes **Reexam**: As ordinary

The learning objectives of the courses (knowledge, skills and competencies) and further information about the form and conditions of the examination are given in Appendix 3.

Volume
30 ECTS

6 8. semester: Internship

The Internship comprises a semester of 30 ECTS and timewise is placed in the 8th semester of the programme. As a general rule the Internship period is paid and settled in a private or public company in Denmark or abroad. Student must be on an Internship for a minimum of 20 full weeks excluding holidays, etc.

The purpose of the Internship is for the student to acquire insight into practical common engineering work corresponding to engineering assistant work, combined with the integrated application of the acquired concepts, methods and techniques of the discipline in the first seven semesters.

The student themselves is responsible for finding an Internship, which must be approved by VIA, who appoints a supervisor for the Internal.

In collaboration with the company, the student prepares a plan for the Internship with appertaining formulated assignments.

The basis for assessment of the Internship is an ongoing report from the student to VIA, feedback from the Internship company and a presentation where the supervisor can ask elaborating questions about the content of the Internship.

If the engineering Internship is interrupted before the end of the agreed Internship period, the Internship supervisor must, in consultation with the head of the education programme, assess whether the Internship has been of sufficient length and content for there to be grounds for passing the Internship present.

The Internship is assessed approved / not approved by the internal supervisor.

7 Electives

The Global Business Engineering program consists of 25 optional ECTS credits, where the student can choose subjects in VIA's engineering programs. Descriptions of the Global Business Engineering education's elective courses appear from the overview below as well as from the course descriptions in appendix 3. Subjects in other fields such as Mechanical engineer or software engineer can be found in the respective curricula as well as on studynet.

It is also possible to choose one course of 5 ECTS from another education program at VIA, but not courses where the content essentially consists of material from the previous courses of study. Any course choice from other programs must be approved by a study advisor in the engineering programs, as it must be ensured that the chosen course is relevant to the program and constitute an increasing academic level.

Electives are offered to the extent that there are sufficient students enrolled in the elective. If the elective is not offered, or if too many people enroll in the course, this can result in the student being assigned his or her second priority.

The following elective courses are offered at the Global Business Engineering program. (Selected electives are taught in Danish - the rest in English).

Subject (5 ECTS)	**Assessment**
Digital Marketing (DMA1)	**Exam**: Individual oral 20 minutes. The final exam counts 100% **Assessor**: Internal **Prerequisites**: Yes **Reexam**: Can take a different form than the ordinary
Strategic Sales Management (SSM1	**Exam**: Individual oral 20 minutes. The final exam counts 100% **Assessor**: Internal **Prerequisites**: None **Reexam**: As ordinary
Entrepreneurship (ENT1)	**Exam**: Group presentation and joint examination with individual assessment. 15 minutes per student – maximum 1 hour per group. The final exam counts 100%. **Assessor**: Internal **Prerequisites**: Yes **Reexam**: As ordinary
Product Management (PRO1)	**Exam**:. Individual oral exam with internal censor based on the written report on the case work and the curriculum. Duration – 20 minutes per student including evaluation. Grade is based on overall assessment of written report and oral examination. **Assessor**: Internal **Prerequisites**: Yes **Reexam**: As ordinary

The learning objectives of the courses (knowledge, skills and competencies) and further information about the form and conditions of the examination are given in Appendix 3.

8 Technical Workshops

The workshops are practice-related courses lasting one week (not ECTS-giving). The courses are conducted in parallel with 2-5 semesters. All workshops are compulsory and some are located outside campus.

The technical workshops structured as illustrated below:

Semester	Workshop Software Specialisation	Workshop Mechanical Specialisation
4. semester	**Advanced Excel (GX-WS3)** Introduction to advance Excel.	
3. semester	**Workshop Software (WS2S)**	**Workshop Mechanical (ME-PWS1 + ME-PWS2)** PWS1: Turning and milling PWS2: Welding, cutting and bending
2. semester	**Know your Profession (GH-WS1)** What jobs can a Global Business Engineer take on within the different field of specialisations.	

The learning objectives of the courses (knowledge, skills and competencies) and further information about the form and conditions are given in Appendix 3.

9 Bachelor Project

BPR1

The programme is concluded with a bachelor project (BPR1) which constitutes 20 of the total 270 ECTS credits of the programme and is finalized with an examination.

The bachelor project must demonstrate independent critical reflection within the chosen topic, and must document the student's ability to apply engineering theories and methods. The bachelor project must also reflect the student's ability to express themselves in an academic and structured manner within their subject.

It is highly recommended that the bachelor project is done in groups of 2-4 students.

The bachelor project includes an independent experimental, empirical and/or theoretical treatment of a practical problem in connection with the central topics of the education programme.

The project must be documented in the form of a report containing a project basis, solution description, calculations, drawings, etc. If the report is a group assignment, it must be clear who wrote which sections of the report.

The students are examined in the project by oral examination/group test with individual assessment in accordance with the programme's overall goals as described in Section 1 of the Curriculum. The basis for examination is the bachelor project. It is a prerequisite for participation in the exam that the bachelor project is submitted within the stipulated deadline and meets the described criteria for the project.

Examinations can take place at the earliest when all the other examinations of the programme, including internships, have been passed. The examination is assessed according to the 7-point scale and with the participation of an external examiner.

Bachelor projekt (BPR1)	Assessment
The purpose is that students must show that they have achieved the objectives set for the Global Business Engineering programme by solving a real-life problem using relevant theories and methods. The project must cover relevant topics within both technical, business and communication	**Exam**: Group examination with individual assessment. Total length of 60-120 minutes depending on number of students. One overall grade for the project report, process report and the oral presentation is given. The project report and process report are weighted with 70% and the oral presentation with 30%. Each part must be passed separately. **Assessor**: External **Prerequisites**: Yes **Reexam**: As ordinary

10 Title and issue of diploma

Graduates who have completed the studies under this curriculum are entitled to use the title **Bachelor of Engineering in Global Business Engineering** and the title **Bachelor of Engineering** in an engineering firm.

Upon completion of the programme, VIA University College issues a diploma indicating title, programme, and information about the results of the grades obtained. Furthermore, the diploma contains information about the bachelor thesis. In addition, the admittance level on which the graduate was admitted to the programme is noted.

Should the education be discontinued, proof of passing study units is issued.

11 Appendix 1 (relevant for students starting in 2019 and 2020)

For students admitted to the programme in 2019 up to and including 2020, the following transitional arrangement will enter into force from August 2021.
Courses that are no longer part of the curriculum has to be passed the no later than winter exam 2022.

Specialization within Software Engineering Technology

Semester *Theme*	**Course** 5 ECTS	**Course** 5 ECTS	**Course** 5 ECTS	**Course** 5 ECTS	**Project** 5 ECTS	**Project** 5 ECTS
9. semester *Bachelor Project*	**Elective**	**Elective**	**BPR1** Bachelor Project			
8. semester *Internship*	**INP1** Engineering Internship					
7. semester *Sustainable Product Development*	**DNP1** .NET programming	**ERP1** ERP systems	**MST1** Strategy, Organisation & Management	**SEP7** Semester Project		
6. semester *Study Abroad*	**Software Elective**	**Software Elective**	**Elective**	**Elective**	**BUI** Business Intelligence	**WEB2** Web Development
5. semester *Innovation & Entrepreneurship*	**SDJ2** Software Development with Java		**SWE1** Software Engineering	**LANG3** Language	**SEP5** Semester Project	
4. semester *Cross Disciplinary*	**DBS1** Database Systems	**RWD1** Responsive Web Design	**FCM1 / ECE1** Financial Management / Economics for Engineers	**LANG2** Language	**INO1** Cross Disciplinary Innovation	**SEP4** Semester Project
3. semester *International Business Development*	**SDJ1** Softwareudvikling med Java		**BUE1** Business Economics	**LANG1** Language	**SEP3** Semester Project	
2. semester *Design & Technology*	**GBC2** Global Business Communication	**MAT2** Mathematics	**MAM2** Global Marketing Management	**ENB-M1** Engineering Basic: Mechanical design	**IBC1** Intercultural Business Communication	**SEP2** Semester Project
1. semester *Robotics*	**GBC1** Global Business Communication	**MAT1** Mathematics	**MAM1** Marketing Management	**ENB-ICT1** Engineering Basic: Software Technology	**SSE1** Study Technique for Engineers	**SEP1** Semester Project

Specialization within Mechanical Engineering Technology

Semester *Theme*	Course 5 ECTS	Course 5 ECTS	Course 5 ECTS	Course 5 ECTS	Project 5 ECTS	Project 5 ECTS
9. semester *Bachelor Project*	**Elective**	**Elective**	**BPR1** Bachelor Project			
8. semester *Internship*	**INP1** Engineering Internship					
7. semester *Sustainable Product Development*	**MEM1** Machine Elements and Design	**ELE1** Electronics	**MST1** Strategy, Organisation & Management	**SEP7** Semesterprojekt		
6. semester *Study Abroad*	**Mechanical Elective**	**Mechanical Elective**	**Elective**	**Elective**	**MEC2** Mechanics	**TER1** Termo Dynamics
5. semester *Innovation & Entrepreneur-ship*	**MMT1** Materials and technologies	**CAD2** Avanceret design in 3D CAD	**TDE1** Technical Design	**LANG3** Language	**SEP5** Semester Project	
4. semester *Cross Disciplinary*	**DYN1** Dynamics	**ENB-M2/PHY1** Electronics and thermo Dynamics	**FCM1 / ECE1** Financial Management / Economics for Engineers	**LANG2** Language	**INO1** Cross - Disciplinary Innovation	**SEP4** Semester Project
3. semester *International Business Development*	**MEC1** Mechanics	**MAT3** Mathematics	**BUE1** Business Economics	**LANG1** Language	**SEP3** Semesterprojekt	
2. semester *Design & Technology*	**GBC2** Global Business Communication	**MAT2** Mathematics	**MAM2** Global Marketing Management	**ENB-M1** Engineering Basic: Mechanical Design	**IBC1** Intercultural Business Communication	**SEP2** Semester Project
1. semester *Robotics*	**GBC1** Global Business Communication	**MAT1** Mathematics	**MAM1** Marketing Management	**ENB-ICT1** Engineering Basic: Software Technology	**SSE1** Study Technique for Engineers	**SEP1** Semester Project

The learning objectives of the courses (knowledge, skills and competencies) and further information about the form and conditions are given in Appendix 3.

Materials and Technologies (MMT1) – 5 ECTS	**Assessment**
The main purpose of the course is to enable the student to choose relevant types of steel based on material properties and to select relevant manufacturing technologies.	**Exam**: Individual oral 20 minutes. Exam counts 100% **Assessor**: Internal **Prerequisites**: None **Reexam**: As ordinary
Machine Elements and Design (MEM1) – 5 ECTS	
To acquire methods and tools in machine elements, technical design and dynamically loaded shafts.	**Exam**: Oral group exam with individual assessment. 30 Minutes The final exam counts 100%. **Assessor**: Internal **Prerequisites**: Yes **Reexam**: As ordinary
Advanced Design in 3D-CAD (CAD2) – 5 ECTS	
The main purpose of the course is to provide the student with the knowledge and methods in the areas of more advanced CAD application used in an industrial environment.	**Exam**: 2 hours Individual test (40%) og group handin (60%) **Assessor**: Internal **Prerequisites**: Yes **Reexam**: Can be oral
Semester Project (SEP5) - 10 ECTS	
The main purpose of the project is to develop or re-develop a product or concept via innovation processes and end up with both a technical solution and a well-founded business plan.	**Exam**: Group examination with individual assessment. 15 minutes per student – maximum 1 hour per group. The final exam counts 100% **Assessor**: Internal **Prerequisites**: Yes **Reexam**: As ordinary

12 Appendix 2 (relevant for students starting in 2018 or earlier)

For students admitted to the programme in 2018 or earlier, the following transitional arrangement will enter into force from August 2021

Specialization within Software Engineering Technology (no changes)

Semester *Theme*	Course 5 ECTS	Course 5 ECTS	Course 5 ECTS	Course 5 ECTS	Project 5 ECTS	Project 5 ECTS
9. semester *Bachelor Project*	**Elective**	**Elective**	**BPR1** Bachelor Project			
8. semester *Internship*	**INP1** Engineering Internship					
7. semester *Sustainable Product Development*	**DNP1** .NET Programming	**ERP1** ERP systems	**MST1** Strategy, Organisation & Management	**SEP7** Semester projekt		
6. semester *Study Abroad*	**Elective**	**Elective**	**Software Elective**	**SWE** Software Engineering	**BUI** Business Intelligence	**AND1** Android Development
5. semester *Innovation & Entrepreneur-ship*	**SDJ2** Software Development with Java		**WEE** Web Engineering	**LANG3** Language	**SEP5** Semester project	
4. semester *Cross Disciplinary*	**DBS1** Database Systems	**RWD1** Responsive Web Design	**FCM1 / ECE1** Financial Management / Economics for Engineers	**LANG2** Language	**INO1** Cross - Disciplinary Innovation	**SEP4** Semester Project
3. semester *International Business Development*	**SDJ1** Softwareudvikling med Java		**BUE1** Business Economics	**LANG1** Language	**SEP3** Semester Project	
2. semester *Design & Technology*	**GBC2** Global Business Communication	**MAT2** Mathematics	**MAM2** Global Marketing Management	**ENB-M1** Engineering Basic: Mechani-cal design	**IBC1** Intercultural Business Communication	**SEP2** Semester Project
1. semester *Robotics*	**GBC1** Global Business Communication	**MAT1** Mathematics	**MAM1** Marketing Management	**ENB-ICT1** Engineering Basic: Software Technology	**SSE1** Study Technique for Engineers	**SEP1** Semester Project

Specialization within Mechanical Engineering Technology

Semester *Theme*	Course 5 ECTS	Course 5 ECTS	Course 5 ECTS	Course 5 ECTS	Project 5 ECTS	Project 5 ECTS
9. semester *Bachelor Project*	**Elective**	**Elective**	**BPR1** Bachelor Project			
8. semester *Internship*	**INP1** Engineering Internship					
7. semester *Sustainable Product Development*	**MEM1** Machine Elements and - Design	**ELE1** Electronics	**MST1** Strategy, Organisation & Management	**SEP7** Semester Project		
6. semester *Study Abroad*	**MEC2** Mechanics	**MED1** Machine Element Design	**TER1** Thermo Dynamics	**Mechanical Elective**	**Elective**	**Elective**
5. semester *Innovation & Entrepreneur-ship*	**TEM1** Technology and Environment	**MTR1** Material Science	**TDE1** Technical Design	**LANG3** Language	**SEP5** Semester Project	
4. semester *Cross Disciplinary*	**DYN1** Dynamics	**ENB-M2** Electronics and thermo Dynamics	**FCM1 / ECE1** Financial Management / Economics for Engineers	**LANG2** Language	**INO1** Cross - Disciplinary Innovation	**SEP4** Semester Project
3. semester *International Business Development*	**MEC1** Mechanics	**MAT3** Mathematics	**BUE1** Business Economics	**LANG1** Language	**SEP3** Semester Project	
2. semester *Design & Technology*	**GBC2** Global Business Communication	**MAT2** Mathematics	**MAM2** Global Marketing Management	**ENB-M1** Engineering Basic: Mechani-cal design	**IBC1** Intercultural Business Communication	**SEP2** Semester Project
1. semester *Robotics*	**GBC1** Global Business Communication	**MAT1** Mathematics	**MAM1** Marketing Management	**ENB-ICT1** Engineering Basic: Software Technology	**SSE1** Study Technique for Engineers	**SEP1** Semester Project

13 Appendix 3: Courses in the Global Business Engineering Programme

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
GBE-BPR2	Bachelor Project (GBE-)	20	**Knowledge, Skills & Competences** The bachelor project must document the student's ability to apply relevant theories and methods from all three areas listed above. It must further show the ability to clearly formulate a relevant problem and in the end demonstrate the ability to solve the problem at a level as would be expected in a real-world business situation. Thus, the report must demonstrate a sufficient level of learning, knowledge and competences in the three core GBE subjects of engineering, business, culture and language plus mastering the combination of these. In addition, the bachelor project must reflect the student's ability to express themselves professionally and in a structured way. Finally, the project must demonstrate individual judgement and self-critical reflection.			Presentation (10 -15 minutes per student) followed by an examination (20-30 minutes per student). External censor The total time for the oral exam including group presentation, examination, evaluation and feedback will be:Groups of one student: 60 minutesGroups of two students: 90 minutesGroups of three or more students: 120 minutes The evaluation is based on the oral presentation of the project, the project report as well as the process report. All the members of the project group are responsible for the entire project report and process report. The contributions of each student must clearly appear from the process report. Standard procedure for re-examination is to write a new project. Timing of re-examination follows the ordinary examination periods at GBE in January and June. There are 3 attempts to pass the bachelor project. Failure to hand in a bachelor report on time results in one missed attempt. Example: report is not handed in for the January exam. Handing in the report for the exam in June will constitute attempt no 2 and so on. 3rd and last attempt will be in January the following year. All in all, the bachelor project must be completed within one year (January-June-January). Exception to these rules will only be granted in the most exceptional of circumstances, e.g. serious illness, and must be approved by the GBE head of Department.
GBE-BUE1	Business Economics	5	After the course the students should be able to:	After the course the students should be able to:	After the course, the students should be able to:	Prerequisites for exam: None Exam type:

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			• Identify and sketch the firm's demand and supply functions • Identify and sketch the optimal price and quantity that maximizes the firm's profit. • Identify and sketch the different market structures • Identify and sketch the aggregate demand and supply for the market / industry • Identify the Macroeconomic tools and objectives • Identify and describe the different macroeconomic policies	• use appropriate tools to model company price and output decisions under different market structures • analyze and assess efficiency and welfare optimality of perfectly and imperfectly competitive markets • analyze and asses the effects of externalities and public goods on efficiency • analyze and assess government policies aimed at improving welfare.	• use the most important theories from "Microeconomics" to analyze the business microeconomic environment • understand cost structures of firms and be able to find the optimal price and quantity that will maximize a firm´s profit under different assumptions of market structures • use the most important theories from "Macroeconomics" to obtain knowledge on the global macro economy • analyze and assess the connection between various macroeconomic changes and the significance of the change to the concrete company	Two written 2 hours individuals tests each counting for 50 % of the total grade. The course grade is the rounded average of the grades for the two tests. If the average of the two tests is < 02 the student must take the re-exam for the test(s) with a grade < 02. Tools allowed: All – except access to internet Re-exam: Same as for original exam.
GBE-DAN2	Danish Culture and Society 2	5	The students should have knowledge about/understand and reflect on: • the Danish language including basic grammar, sentence structure, vocabulary and pronunciation.	After the course, the students should be able to: • Read and understand the contents of a broad selection of texts, which describe everyday life in Denmark. • Scan texts/locate information relevant to everyday life in Denmark. • Write easier texts. • Acquire knowledge about Danish culture and society.	After the course, the students should be able to: • Communicate in Danish in an understandable language, orally and in writing. • Function and cooperate with people with different educational, language, and cultural backgrounds. • Understand and discuss every day conditions in a comparatively simple language.	**Oral Examination** Individual oral examination based upon a subject found by draw. No preparationAllowed tools: None External examiner. The oral examination is weighted 70 %. In addition, 3 compulsory tests are conducted during the course. 2 of these will count 30 % toward the final mark. In the event of a borderline mark, participation during the course influences the outcome. Please note that re-examinations may take a different form than the ordinary exams.
GBE-DAN3	Danish Culture and Society 3	5	The students should have knowledge about/understand and reflect on: • Extracting the essence of a job announcement and formulating CV and job application. • Fundamental grammar, communication skills, comprehension.	After the course, the students should be able to: • Extracting the essence of a job announcement • Formulating a CV and job application • Making a job interview in Danish • Acquire knowledge about Danish culture and society.	After the course, the students should be able to: • Communicate in Danish in an understandable language, orally and in writing. • Function and cooperate with people with different educational, language, and cultural backgrounds. • Understand and discuss every day conditions in a comparatively simple language.	**Oral Examination** Individual oral examination based upon an application. Individual oral examination based upon a subject found by draw No preparation. External examiner. The oral examination is weighted 70 %. In addition, 3 compulsory tests are conducted during the course. In the event of a borderline mark, participation during the course influences the outcome. Please note that re-examinations may take a different form than the ordinary exams.
GBE-DMA1	Digital Marketing	5	he students will be introduced to core theories, models and tools in the field of digital marketing that will result in knowledge of:	At the end of this course, and having completed the essential reading and activities, the students should be able to	After a successful completion of the course the student will have the competencies to:	Prerequisites for exam: Mandatory assignment handed in before deadline and in line with the project description and requirements including alignment with the VIA

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			• The role of digital marketing as a part of business world and company's overall marketing strategy using the SOSTAC model • Integrated digital marketing by using the RACE framework • Translating SMART goals into digital strategy formulation • To validate the relevance and the usefulness of tools in connection with decisions concerning DM strategic choices. • Based on a digital marketing strategy analyse, map and design the customer experience • Developing customer personas • Online customer journeys with digital touchpoints • Understand social media's potential for relationship-building and online community creation. • Lead generation and qualifying of prospects with inbound marketing methods • SEO and SEM (paid search marketing)Marketing automation • To identify the control methods for DM programs that correspond with business objectives.	• Participate in the planning and execution of a company's digital marketing • Identify key factors relevant for the planning process • Define DM KPIs corresponding with business objectives • Choose and integrate relevant digital channels into a company's overall marketing strategy, depending on context and objectives • Describe social profiles/personas • Create customer journey maps with relevant digital touch points	• Develop strategies for obtaining competitive advantages through digital marketing • Measure and evaluate on a company's digital marketing strategy • Design DM strategies according to a company's objectives and available resources. • Utilize social media's potential for relationship-building and online community creation • Analyse and identify best ways to attract customers via SEO efforts • Develop strategies for marketing automation	Guidelines for Writing Projects. The written project accounts for 30% of the total grade. Exam type: Individual oral examination. The exam will include student's presentation of key aspects of the group project. It should include reference to:The corresponding course models and theoriesThe key findings and recommendationsAdditional reflections / personal comments outside of the written reportA Q&A will follow Oral Exam accounts for 70% of the total grade (Total time 20 min: 5 min presentation, 10 min Q&A, 5 min evaluation). Internal censor Tools allowed: All aids are allowed Re-exam: Please note that re-examinations may take a different form than the ordinary exams.
GBE-EBM1	Engineering Basic: Mechanical Design	5	The students should acquire knowledge about: • The SI unit system • Kinematics: velocity and acceleration in 1D and 2D, projectile motion • Dynamics: Newton's Laws, work, kinetic and potential energy.	After completing this course, the student will be able to: • Correctly use the SI-unit system and perform dimensional checks of calculations • Analyze and solve simple problems within kinematics and dynamics	The students should gain competences in: • Reading scientific text including formulae, graphs, diagrams etc. • Applying an analytical and systematic approach to simple, stylized engineering problems • Communicating simple calculations using concise language, formulae, and sketches	Prerequisites for exam: There will be a mandatory course work corresponding to a minimal workload of 10 hours for the student. If the course work is not handed in and approved by the deadlines set by the teacher, the student has used one exam attempt. New deadlines for hand-in and approval will then be set. Type of examination Written 4 hours exam. If the student chooses to answer the exam using pen and paper, he or she must scan the solution sheets after the 4 hours. Scanners will be provided.

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
						Internal examiner Allowed tools All usual aids Re-examination As ordinary Please note that the school can decide that the re-examination can be oral
GBE-EBS1	Engineering Basic - Software Technology	5	• Describe the basics of computer software program logic and flow. • Describe imperative programming concepts, including assignments, loops, variables, conditions, and expressions. • List common data types and describe the concept of type conversion. • Identify the basic components of computer hardware architecture. • Describe the components and properties of embedded systems. • Identify the basic UML activity diagram notations and symbols. • Identify and describe the different stages of a software development process.	• Solve basic programming tasks through a visual programming language and scripting. • Work with basic data structures, including arrays. • Apply the basic operations of boolean algebra. • Design and describe an IT system, including using UML activity diagrams. • Create simple interactive applications and games.	• Design and implement an IT system. • Design, construct, and program embedded systems for specific activities and scenarios. • Delimit an open problem domain. • Solve problems through an analytical, engineering approach.	Prerequisites for exam: Mandatory assignments handed in before deadline and accepted. Exam type: Written examination. Duration: 1 hour. Multiple choice and written answers. Internal examiner. Tools allowed: None. Re-exam: As ordinary exam.
GBE-ENB-M2	Engineering Basics for Mechanical Engineering 2	5	The student should acquire knowledge about: • Within the topic of DC electricity: • Electric charge, electric potential, current and resistance, Ohm's law, electric power, circuit analysis, solar panels. • Within the topic of thermodynamics: Temperature and heat, phase changes and heat transfer, the ideal gas equation	After completing this course the student must be able to: • Solve simple exercises in electrostatics • Solve simple exercises related to DC circuits • Solve simple exercises in thermodynamics	After completing this course, the student must be able to apply the acquired knowledge and skills in simple real-world problems, in order to follow more advanced courses within electricity and thermodynamics, and to independently acquire further knowledge.	4 hours written final examination, external co-assessor. All usual tools allowed.
GBE-ENT1	Entrepreneurship	5	The student will obtain a profound understanding of how to use reflection in areas as innovation, entrepreneurship, establishing and qualifying a business identity, understanding complexity in business, leadership and projects generating value on entrepreneurial premises.	The student will be able to establish, identify and differentiate a business idea on practical as well as immaterial perspectives, have integrated the entrepreneurial way of working on personal-, team- and organizational level and be able to use many sources and perspectives for creating value in projects, idea generation etc.	The student will have acquired competencies to generate business ideas, qualify business ideas, reflect on operationalize business ideas. First, obtaining a fundamental knowledge of how entrepreneurship differs from more traditional ways of thinking about business and how to handle complexity in relation to business creation or change and personal	Prerequisites for exam: Hand in of both group and individual assignments. Exam type: Oral group examination consisting of a group presentation followed by a discussion between students and examinators. Duration of exam will be 60 minutes to groups of 3 or 4 persons or 75

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
					characteristics related to the student and business partners.	minutes to groups of 5 or 6 persons. Internal censor is used. Individual grade is based on overall assessment of written group report, presentation and discussion and individual report. Tools allowed: All Re-exam:As ordinary.
GBE-FCM1	Financial Management	5	Upon completion of this course, the student will be able to: • Read and understand company financial reports • Explain how companies make decisions on investments and carry out risk assessments in connection with investment decisions • Identify methods for making calculations and assessments of investment proposals • Identify different options for raising capital for company investments • Explain methods for optimizing companies' use of working capital	Upon completion of this course, the student will be able to: • Analyze and interpret company financial reports in a communication context. • Select and apply methods for making calculations and assessments of companies' investment proposals • Select and apply methods for analyzing the risk profile of companies' investment proposals • Use methods to measure company financial performance • Apply methods that can optimize companies' use of working capital	Upon completion of this course, the student will be able to: • Carry out and present calculations of the return on an investment, perform sensitivity analysis and set up relevant scenarios and probability analysis. • Act as a constructive sparring partner for executives' who are responsible for decisions about strategic investments in and financing of capital equipment and or product/market development • Evaluate and present the financial consequences of an investment proposal.	Prerequisites for exam: None Exam type: Written examination - Duration: 3 hours All students will be evaluated on their ability of applying the taught methods to a practical case exercise. It will be looked at, if the students are able to analyse the presented data in relation to the actual situation and evaluate on risk factors. External censor Examinations account for 100 % of final grade. Tools allowed: Course literature according to the course description Personal notes laptop Calculator Re-exam: Please note that re-examinations may take a different form than the ordinary exams.
GBE-FRE2	French Business Language I	5	The students should have knowledge about/understand and reflect on: • the French language including basic grammar • sentence structure, vocabulary and pronunciation	After the course, the students should be able to: • use relevant business terminology • read and understand authentic texts in French on issues relating to business and industry	After the course, the students should be able to:communicate in French in a clear language, orally and in writing, in international contexts.function and cooperate with people with different educational, language, and cultural backgrounds.structure own learning in an effective way and critically acquire new knowledge within relevant engineering areas.put the knowledge of the language	**Oral examination** Individual oral examination based upon a subject found by draw. Preparation time 40 minutes. Allowed tools: All

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			• business and industry in France • Topics relating to business and industry in other French-speaking countries can also be included.	• find, use, and discuss information in French on business subjects • make presentations in French on various subjects • prepare simple texts in French with special focus on the global business engineer's professional area	and the French society and the French-speaking countries into practice in an international context.	External examiner Please note that re-examinations may take a different form than the ordinary exams.
GBE-FRE3	French Business Language II	5	The students should have knowledge about/understand and reflect on: • The French language, including syntax, phonetics, grammar, and semantics. • French industry and business life. • Intercultural affairs and business protocol in France and/or French-speaking countries. • How to make presentations.	After the course, the students should be able to: • Read, understand and discuss texts in French on social, business and engineering issues. • Be confident in using appropriate terminology within subject areas discussed in class. • Negotiate with French-speaking cooperation partners. • Make presentations in French. • Express themselves orally in French with a rather high level of accuracy.	After the course, the students should, to a high extent, be able to: • Communicate in a clear language, orally and in writing, in international contexts. • Function and cooperate with people with different educational, language, and cultural back-grounds. • Structure own learning in an effective way and critically acquire new knowledge within relevant engineering areas. • Put the knowledge of the language and the French society and the French-speaking countries into practice in an international context.	The student is examined on the basis of: 1) A presentation and discussion of a previously unknown text handed out prior to the preparation, and one or more questions to the course curriculum. OR a negotiation case where the student plays one part and the lecturer the other part, and one or more questions to the course curriculum. 2) A presentation of the semester project SEP5 (10 min. power point presentation). All aids are allowed during preparation. Please note that re-examinations may take a different form than the ordinary exams.
GBE-GBC2	Global Business Communication 2	5	After the course the students should be able to • identify approaches to writing persuasive messages in English. • identify requirements to project writing in English. • account for the conventions of technical writing in English. • describe different aspects of the semester theme. • account for different academic writing requirements in terms of syntax, coherence and structure.	After the course the students should be able to: • analyse a communication situation as to target group, message, choice of communication channel etc. • communicate precisely and with a varied vocabulary in English, orally as well as in writing. • apply different academic writing requirements in terms of syntax, coherence and structure. • discuss linguistically complex texts in English.	Students should, in their project work, during their internships, and in their jobs as global business engineers, be able to: • apply selected relevant approaches when writing professional messages. • communicate effectively and professionally with a company's internal and external stakeholders, using correct terminology and syntactically correct structures in speech and writing • interact and cooperate with people from different cultural	Prerequisites for exam: The mandatory course activity (one group presentation of a technical subject) must be completed and handed in before deadline and accepted/approved by the lecturer. Exam type: 4-hour written exam with external examiner. The exam must be passed separately to pass the course overall. Tools allowed: All tools except for Internet access.

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
				• apply relevant terminology within business and technical subjects. • apply the conventions of technical writing in English. • present the results of self-studied subjects in English • professionally.write a project report in accordance with the guidelines. • present aspects of the semester theme orally in a clear and concise language	backgrounds.critically acquire new knowledge within relevant job-related areas	
GBE-GER2	German Business Language I	5	The students should have knowledge about/understand and reflect on:the German language including basic grammarsentence structure, vocabulary and pronunciationbusiness and industry in Germany Topics relating to business and industry in other German-speaking countries can also be included.	After the course, the students should be able to:use relevant business terminologyread and understand authentic texts in German on issues relating to business and industryfind, use, and discuss information in German on business subjectsmake presentations in German on various subjectsprepare simple texts in German with special focus on the global business engineer's professional area.	After the course, the students should be able to:communicate in German in a clear language, orally and in writing, in international contextsfunction and cooperate with people with different educational, language, and cultural backgroundsstructure own learning in an effective way and critically acquire new knowledge within relevant engineering areasput the knowledge of the language and the German society and the German-speaking countries into practice in an international context.	Admission to the examination is on condition that 1) a number of written assignments - stipulated by the teacher at semester start - has been handed in on time and approved and that 2) one oral presentation has been made and approved within the stipulated deadline. **Oral examination**Individual oral examination based upon a subject found by drawNo preparationPreparation time 40 minutes, examination 20 minutes. Allowed tools: All External examiner. Please note that re-examinations may take a different form than the ordinary exams.
GBE-GER3	German Business Language II	5	Have knowledge about/understand and reflect on: • The German language, including syntax, phonetics, grammar, and semantics. • Have knowledge about German industry and business life. • Have knowledge about intercultural affairs and business protocol in Germany and/or German-speaking countries. • Have knowledge about how to make presentations.	After the course, the students should be able to: • Read, understand and discuss texts in German on social, business and engineering issues. • Be confident in using appropriate terminology within subject areas discussed in class. • Negotiate with German-speaking cooperation partners. • Make presentations in German.Express themselves	After the course, the students should, to a high extent, be able to: • Communicate in a clear language, orally and in writing, in international contexts. • Function and cooperate with people with different educational, language, and cultural backgrounds. • Structure own learning in an effective way and critically acquire new knowledge within relevant engineering areas.	Admission to the examination is on condition that 3 compulsory written assignments will be handed in and approved within the stipulated deadlines. The student is examined on the basis of: 1) A presentation and discussion of a previously unknown text, handed out prior to the preparation, and one or more questions to the course curriculum. OR a negotiation case where the student plays one part and the

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
				orally in German with a rather high level of accuracy.	• Put the knowledge of the language and the German society and the German-speaking countries into practice in an international context.	teacher the other part, and one or more questions to the course curriculum. 2) A presentation of the semester project SEP5 (10 min. power point presentation). All aids are allowed. Please note that re-examinations may take a different form than the ordinary exams.
GBE-IBC1	Intercultural Business Communication	5	After the course the students should be able to identify: • the basic structures, elements and functions of culture • cultural value dimensions • verbal and nonverbal intercultural communication • the importance of culture and intercultural communication in international business • business culture in selected areas in the world • intercultural management, leadership, teamwork, sales situations, negotiations, and conflicts. knowledge of use of English language. • knowledge of presentation techniques.	After the course the students should be able to:explain how culture affects aspects of • international communication and management. • acquire a better understanding of his/her own cultural conditioning. • distinguish the major dimensions which define cultural differences among societies or groups. • recognise the cultural variables in the communication process and what factors can cause noise in the process. • successfully manage cross-cultural communications, sales and negotiation situations. • express themselves fluently and accurately in presentation, conversation and discussion in oral English language. • be able to apply presentation techniques and present a topic in nuanced and well-structured English language.	Upon successful completion of this course, the student will be able to • identify, accept and adjust to cultural similarities and differences. • find, apply and evaluate literature and information in general on cultural practice in a country or region . • apply effective communication strategies depending on situation, context and culture. • act in different international environments in connection with sales and negotiation situations. • express themselves fluently and accurately in oral English language. • be able to apply presentation techniques in a professional way.	Prerequisites for exam: One approved mandatory group presentation. Exam type: An individual oral exam with an external examiner. The oral examination will be based upon a subject found by draw. The examination accounts for 100 % of the final grade. The final grade for this course will be comprised of the following: knowledge of the course theory 75%, oral English language skills 25 %. Duration: 20 min. incl. voting. Preparation 20 min. External examiner Tools allowed: All aids are allowed. Reexam: Same as ordinary.
GBE-INO1	Engineering Innovation Weeks (GBE/XA)	5	After having successfully completed the course, the students will have gained: An understanding of innovation and its uses within the field of engineering-Knowledge about Design Thinking (double diamond) processKnowledge about how to create a systematic and measurable progress in innovation tasks	After having successfully completed the course, the students will be able to:Engage in innovative processes in a cross-/inter-/multidisciplinary settingConceive, plan, and execute innovative ideasWork methodically with innovationCollect and apply relevant information about technologies, markets and end users	After having successfully completed the course, the students will have gained competences in:Introducing innovative ideas into project workContributing own professional skills in teams with the objective of solving problems by using innovative processes and modelsClarifying multidisciplinary group competencies	Prerequisites: Mandatory assignments handed in before deadline and accepted. Attendance 80% Type of examination: Individually writtten multiple choice test, with a duration of 30 minutes,

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
						performed without aids. Internal examiner. (15/25 correct answers is required to pass the test). Allowed tools: No tools allowed (besides laptop for test) Re-exams:
GBE-INP1	Engineering Internship (GBE-)	30	The student must: • gain knowledge of theory, methodology and practice within a profession or one or more fields of study • be able to understand and reflect on theories, methodology and practice • be aware of non-technical – societal, health and safety, environmental, economic and industrial – implications of engineering practice.	The student must: • be able to apply the methodologies and tools of one or more fields of study and to apply skills related to work within the field/fields of study or profession • be able to assess theoretical and practical problems and to substantiate and select relevant solutions • be able to communicate professional issues.	The student must: • be able to handle complex and development oriented situations in study or work contexts • be able to independently participate in professional and interdisciplinary collaboration with a profes-sional approach • be able to identify own learning needs and to organise own learning in different learning environments • promote an engineering-oriented approach during the remaining semesters on the Bachelor pro-gramme • develop personal skills required for the professional career as engineer • form the basis for developing personal/professional network	In order to get an internship evaluated, the student must fulfill the following requirements concerning mandatory assignments: • Expected outcome/specific learnings targets for the internship position • Company presentation • Logbook • Main academic assignment(s) • Final reflections • Participation in workshop for coming interns
GBE-MAM1	Marketing Management 1	5	The students are introduced to core theories and models within marketing management to have knowledge about: • use and limitations of macro and micro environmental analysis • the competitive environment in which the company operate • show to develop a cohesive marketing strategy for companies operating in B2B and B2C markets • customer value, satisfaction and loyalty as the basis for all successful marketing strategies • customer behaviour and how purchase decisions are made at the individual, group and organizational level • dimensions of sustainable marketing and corporate social responsibility • market segmentation criteria,	At the end of this course, and having completed the essential reading and activities, the students should be able to • apply core theories and models within marketing management to practical marketing problems while acknowledging their use and limitations • perform a macro environmental analysis • perform a competitor analysis regarding identification of competitors, their goals, strategies and marketing mix • perform an industry analysis on attractiveness • identify key markets and customer trends with their possibilities and threats • analyse customer behaviour in both consumer and business markets, determine customer needs and determine how	After a successful completion of the course the student will have the competencies to: • identify, analyse and evaluate a company's strength and weaknesses in a relevant external marketing environment • use dimensions of BTB and BTC customer behaviour in marketing planning • analyse and evaluate strategic marketing challenges in relation to overall market trends and developments • examine marketing approaches to sustainable marketing • design a competitive marketing strategy encompassing segmentation, target group definition and positioning • identify, discuss and recommend a marketing mix to a	Prerequisites for exam: Approved mandatory group presentation Exam type: 4-hour written exam with external examiner. The examination accounts for 100 % of the final grade.. Tools allowed: All aids are allowed except access to the Internet. Re-exam: Please note that re-examinations may take a different form than the ordinary exams.

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			• target group definition and what constitutes a competitive marketing positioning strategyhow to develop a marketing mix.	product purchase decisions are made • identify elements of sustainable marketing in a company's marketing strategy • segment markets in order to determine appropriate target groups and to develop a fitting strategy and positioning to cover their needs while being competitive • identify and chose amongst alternative growth strategies execute the strategy with an effective marketing mix comprising concepts such as brand equity, product strategy, product life cycle management, service management for services, choosing an appropriate pricing strategy, managing distribution channels and mass/personal/digital communication	given strategic market situation	
GBE-MAM2	Global Marketing Management	5	The students are introduced to core theories and models within marketing management to have knowledge about: • The difference between global, glocal and local international marketing strategies • The steps in the international marketing process and the complexities of the international marketing environment • The current state of global marketing, the forces driving globalization and the resulting challenges for both existing international companies and for domestic companies planning to start an internationalization process • The specific problems associated with international marketing and the internationalization process	At the end of this course, and having completed the essential reading and activities, the students should be able to • Perform a market profile of a country by conducting a PEST and market analysis (Macro & Micro factors) • Critically evaluate a company's international marketing environment and its current strategy • Access the opportunities and risks associated with initiating an international market strategy or expand an already international presence to new countries for both small and large companies • Provide input to international market expansion strategy development • Assess how CSR and sustainability can contribute to a company's value chain practices	After a successful completion of the course the student will be able to: • Identify global market opportunities and assess the associated risks • Conduct a detailed country analysis including both macro and micro market factors • Quickly and effectively research market opportunities and to apply relevant country selection screening and segmentation criteria • Develop a global marketing strategy and prepare an international marketing plan that is aligned with the objectives and competencies of the company (including sustainability and CSR) • Analyse and determine the most appropriate method of market entry	Prerequisites for exam: Approved mandatory group presentation Exam type: 4-hour written exam with external examiner. The examination accounts for 100 % of the final grade. Tools allowed: All aids are allowed except access to the Internet. Re-exam: Please note that re-examinations may take a different form than the ordinary exams.

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			• All aspects of international marketing strategy development and the international marketing planning process • The sustainable global value chain, Corporate social responsibility and triple bottom line • The differences in social/cultural conventions that affect buyer behaviour and marketing strategies in international markets • Internationalization strategies for both small and large companies • Conducting effective search, screening and selection of new countries to enter • The complete range of market entry methods and their advantages and disadvantages • International marketing mix strategies	and improve the competitiveness • Decide which markets to enter and evaluate the pros and cons of different entry modes • Design an international marketing mix including the ability to determine which parts of the marketing mix will require adaptation and to which degree		
GBE-MATx	Engineering Mathematics	5	After the course the students should be able to solve simple mathematical problems within the areas of: • Basic order of operations: solving linear equations and fraction rules • Functions: Logarithmic, exponential and trigonometric functions including laws of exponents • Vectors in 2D: Order of operations, scalar, angle, magnitude, determinant, area, equations, perpendicularity, parallelism, lines, decomposing of a vector. • Differential calculus: Power rule, chain rule, product rule, quotient rule, tangent, exponential, logarithmic and trigonometric functions. • Integration: Power rule and definite integrals. • Number sets • Number systems	After the course the students should be able to: • analyse simple problems within 2D vectors and differential calculus, • apply relevant terminology within basic mathematical subjects.	In their project work, during business and engineering courses which are part of the global business engineering programme, and in their future jobs as global business engineers, the students should be able to: •Apply mathematical knowledge in solving specific problems	Prerequisites for exam: None Exam type: Written 4 hour individual test The course grade is the rounded average of the grades for the two tests. If the average of the two tests is < 02 the student must take the re-exam for the test(s) with a grade < 02. Re-exam: Same as for original exam. Tools allowed:Course literature according to the course descriptionPersonal notesLaptop (no web access)Calculator.
GBE-MST1	Strategy, Organization and Management	5	After the course, the students should be able to: • Describe organizational behavior and structures	After the course the students should be able to:	After the course the students should be able to:	Prerequisites for exam: Hand in ~~of a written report on the~~ case wor~~k.~~

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			• Define the concept of management and leadership including the different styles of management and leadership • Identify the basic issues of business strategy • Describe the elements of the strategic planning process and a range of strategic tools.	• Evaluate, design, and choose appropriate organizational structures • Evaluate and choose relevant management and leadership strategies • Apply methods for organizational change processes • Analyze the external macro and micro environment in the context of business strategy making • Analyze the internal environment in the context of business strategy making • Summarize strategic options • Explain how to design, evaluate, choose and implement appropriate business strategies	• Compare and discuss the basic issues of management and leadership • Evaluate and apply the appropriate kind of management/leadership in a given situational context • Compare and discuss the basic issues of business strategy • Apply different strategic tools • Apply methods for implementation of a strategic planning process in an organizational context	Exam type: 4 hour written exam with external censor. Tools allowed: All Re-exam: As ordinary.
GBE-PRM1	Project Management	5	The students will be able to: • Apply the planning process method to a complex project • Describe and explain what it takes to manage and run a complex project	The students will be able to use the methodology and tools for… • Estimating Project Time and Costs • Planning a Project • Using Risk Management • Conducting Team Management • Completing a project	During the course the students will work with analysis of a real time project and by applying acquired theoretical knowledge being able to outline used methods and tools including: • Project Description / Scope • Project plan • Project organization • Risk Analysis • Communication plan based on stakeholder analysis All leading to successfully managing and controlling a project. .	Prerequisites for exam: Hand in and acceptance of all mandatory group assignments. Exam type: Written examination consisting of two reports. One being the written group report on the case work handed in before end of semester and one being a final individual reflection report produced after hand in of group report External censor is used. Grade is based on overall assessment of written group report and individual report. Tools allowed: All Re-exam: As ordinary
GBE-PRO1	Product Management	5	After the course, the students should be able to: • Define what is a Product, a Product Line, a Product Portfolio, Product Elements, Modules and Platforms in relation to both software and more tangible products.	After the course the students should be able to: • Explain and evaluate relevant Product Management tools and processes • Explain how to design, evaluate, choose and implement appropriate Product Management tools and strategies	After the course the students should be able to: • Compare and discuss the basic issues of Product Management in an organizational context • Evaluate and apply the appropriate Product Managements tools and models	Prerequisites for exam: Hand in of a written report on the case work. Exam type: Individual oral exam with internal censor based on the written report on the case work and the curriculum. Duration – 20 minutes per student including e-v a lu-ation.

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			• Understand the roles and responsibilities as a Product Manager • Describe the elements of the product management planning process and a range of product management tools.	• Understand product development concepts and expectations for Product Managers	• Apply methods for implementation of a Product Master plan planning process in an organizational context	Grade is based on overall assessment of written report and oral examination. Tools allowed: All Re-exam: As ordinary.
GBE-PWS4	Practical Workshop 4	-				
GBE-SEP1 (Applies for August 2021 enrollment)	Semester Project 1 (GBE-)	5	**Project method learning objectives:** The students must be able to: <u>Effective teams</u> - explain included theories about group dynamics, team collaboration and conflict resolution. <u>Own learning process</u> - refer to involved theories of learning, motivation, feedback and study techniques. <u>Project framework</u> - identify relevant knowledge in relation to academic and technical written communication, including the report's structure, references and source management. - identify relevant presentation techniques for the target group, as well as use presentation techniques. <u>PBL</u> - explain basic elements of PBL. - identify relevant issues and specific requirements for a problem formulation. <u>Project management</u> identify relevant project management methods, including planning, meeting management, risk assessment and quality assurance **Professional knowledge learning goals** The students must be able to: <u>Engineering Basics Software (EBS)</u> - identify and describe the different stages of a software development process. - explain the functionality of a software	**Project method learning objectives:** The students must be able to: <u>Effective teams</u> - jointly formulate and apply a group contract in the group work. - enter into and establish collaboration with the project group and supervisor. <u>Own learning process</u> - apply knowledge of learning theory and motivation theory in connection with own learning process and give and receive feedback. <u>Project framework</u> - act in a source-critical way as well as use references and source management, including rules for plagiarism. - communicate the results of the project work and the project group's learning process in a structured way using professional concepts, both in writing and graphically. - communicate in writing to different target groups. <u>Problem-based learning</u> - set up a problem formulation, describe different solution options and explain solution proposals. <u>Project management</u> - explain the choice of and use of tools and methods for project management in order to achieve concrete goals in the project work. **Professional learning goals** The students must be able to: <u>Engineering Basics Software (EBS)</u> - analyze a problem area in order to derive requirements.design and build a software system. - develop software to control a robot.	**Project method learning objectives:** The students must be able to: <u>Effective teams</u> - describe and reflect on the project group's collaboration - including their own efforts - to define opportunities for improvement for future projects. <u>Own learning process</u> - reflect on their own ability to learn through the various teaching activities, including the project group's work. <u>Problem-based learning</u> - take responsibility for the student-led part of the semester project **Professional learning goals** The students must be able to: <u>Engineering Basics Software (EBS)</u> - reflect on the development of a software system for a specific purpose. - plan and execute a software development process <u>Business Economics (BUE)</u> - plan and carry out a macroeconomic analysis of a given country. - reflect on the importance of macroeconomic conditions in a given country in connection with decisions and outsourcing <u>Global Business Communication 1 (GBC1)</u> - reflect on their own ability to communicate in writing in English on behalf of a company using correct subject terminology. - reflect on collaboration across cultures.	Admission criteria for exam: Project report and process report must be submitted before the deadline set by the supervisors. The project report should be between 20-22 pages excluding appendices. (1 page = 2400 characters including spaces). The process report should be according to guidelines. Examination form: Individual grades are given on the basis of an overall assessment of the submitted work. It must be clearly stated who is the author of the individual parts of the project report and the process report. Internal examiner. Permitted aids: All Reexamination: The internal examiner decides whether the student who has not passed the semester project must submit a revised project report or complete a new project. For students who have not passed the semester project, an information meeting will be held at the end of the spring semester. Here, information is provided on specific deadlines and detailed courses for the project work, just as new project groups are formed where possible in relation to the number of failed students in the individual semesters. Based on the feedback the students have received after the ordinary exam, either a new project must be prepared or the non-passed project must be revised.

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			system. - describe and give examples of software systems. Business Economics (BUE) - identify and describe macroeconomic characteristics and development trends for a given country. Global Business Communication 1 (GBC1) - account for theoretical and practical knowledge about how companies communicate professionally both internally and externally. - explain relevant aspects in written presentation techniques.	- use dynamic models to describe the behavior of a software system. - perform tests in relation to derived requirements. - apply a project methodology to structure the development work Business Economics (BUE) - identify and analyze the macroeconomic policies pursued in a given country and its significance for companies' decisions to outsource production and development tasks to that country. Global Business Communication 1 (GBC1) - structure and formulate a written project report in English on the semester project's problem formulation, solution proposals and conclusion in clear and precise English using correct subject terminology, grammar and syntax. - structure and describe a process report on the work on the semester project in clear and precise English.		
GBE-SEP2 (Applies for August 2021 enrollment)	Semester Project 2 (GBE-)	10	**Project method learning objectives:** The students must be able to: Effective teamsrefer to knowledge about own strengths and weaknesses in connection with group workinclude theories about personal profiles and personal and interpersonal competencies as well as cultural differences Project management identify relevant project management methods, including planning, meeting management, risk assessment and quality assurance. **Professional knowledge learning goals** The students must be able to: - Mechanical Engineering Basic (EMB1) Product development set specifications in terms of physical measurements and propertiesanalyse and apply experimental results in calculations	**Project method learning objectives:** The students must be able to: Effective teamsidentify and describe the group's development.apply reviewed theories on personal profiles as well as cross-cultural aspects in group collaboration in order to describe any conflicts in group collaboration and find possible solutions to them. Own learning processdescribe needs in relation to one's own motivation for learning and act accordingly.identify and apply preferred study techniques.set and reflect on own learning goals from the current and previous semester in the process report with a view to future improvement. Project frameworkcommunicate the results of the project work and the project group's learning process in a structured way using professional concepts, both written, graphic and oral.apply knowledge of references and source management. PBLdescribe the factors that influence the individual and group-based learning	**Project method learning objectives:** The students must be able to: Effective teamstake responsibility for the collaboration in the group and actively use and further develop the group contract.set up and select development and action opportunities in relation to the group's development. Own learning processindependently give and receive constructive feedback in connection with one's own and others' learning process.independently adapt own learning process based on experience and knowledge of own preferences. Project frameworkwork methodically and structured with the semester project in the project group.Project-based learningtake responsibility for the student-led part of the semester project. Project managementtake responsibility for the management of the project work with continuous adjustments between tasks and resources.	Admission criteria for exam: Project report and process report must be submitted before the deadline set by the supervisors. The project report should be between 20-30 pages excluding appendices (1 page = 2400 characters including spaces). The process report should be according to guidelines. Examination form: Group exam with individual assessment. Group presentation approx. 15 minutes followed by a joint examination with a joint discussion and individual question rounds for approx. 15 minutes per student including voting. Individual grades are given on the basis of an overall assessment of the submitted work as well as the individual's performance during the examination. Internal examiner. Permitted aids: All

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			Presentationconvey technical knowledge in the form of calculations in a readable structured form Marketing Management (MAM1)how to develop and prepare a marketing plan Global Business Communication 2 (GBC2)explain how a project report is communicated in writing in professional English with the correct use of subject terminology.explain relevant aspects in oral and written presentation techniques	in the PBL course.work on the basis of the project group's own problem formulation.work interdisciplinary. Project managementuse profession-related methods and tools in project work.use digital tools such as Office tools, digital project management as well as digital tools and portals. **Professional learning goals** The students must be able to: Mechanical Engineering Basic (EMB1)select and apply what is applicable from syllabususe idea generation tools in practice.apply skills from the subjects:Compile free body diagramsdo a 3d modellingstructure a presentation of calculations Marketing Management (MAM1)Analyse a market by collecting relevant data relating to macro trends (PEST analysis) and trends in the micro environment (competitors and customers)Segment a market based on relevant segmentation criteriaSelect a target group based on a fit between company competences and market profitability Summarize the market analysis using the SWOT analysisdevelop a marketing mix taken the chosen strategy into practice (target group, positioning and competitive advantages). Global Business Communication 2 (GBC2)plan and analyse the communication situationstructure the project report, and organize the text in logical, coherent sections.write the project report in a professional style used in business communication and according to the guidelines for writing reports in VIAuse grammatically correct written Englishpresent the results of the project work orally in a clear and concise language	**Professional learning goals** The students must be able to: Mechanical Engineering Basic (EMB1)make a physical measurement of a product based on an analysis of movement.provide a structured presentation of drawings and calculations Marketing Management (MAM1) Develop a competitive marketing plan including strategic reflections, target market selection, an appropriate competitive strategy and a suitable marketing mix based on conclusions from the market analysis Global Business Communication 2 (GBC2)reflect on own ability to communicate in writing and orally in English on behalf of a company using correct subject terminology.reflect on collaboration across cultures.	Re-examination: The internal examiner decides whether the student who has not passed the semester project must submit a revised project report or complete a new project. For students who have not passed the semester project, an information meeting will be held at the end of the spring semester. Here, information is provided on specific deadlines and detailed courses for the project work, just as new project groups are formed where possible in relation to the number of failed students in the individual semesters. Based on the feedback the students have received after the ordinary exam, either a new project must be prepared or the non-passed project must be revised. The project must be handed in by the agreed deadline before the autumn semester. Examination is conducted around the beginning of the autumn semester. When submitting a revised project report, the main supervisor can also decide that submission and examination will instead be carried out in connection with the coming re-examination period.
GBE-SEP3	Semester Project 3 (GBE-)	10	Project method learning objectives: The students must be able to: Effective teamsexplain included theories in order to increase the effectiveness for the group as a whole but also for the individual student Professional knowledge learning goals The students must be able to:	Project method learning objectives: The students must be able to: Effective teamsplan the project group's process focus on the group's learnings and goalsidentify and apply methods for solving basic cross-cultural communication and collaboration problems.	Project method learning objectives: The students must be able to: Effective teamsapply own experience and knowledge to strengthen group collaborationreceive and reflect on guidance and facilitation of group collaborationtake responsibility for structuring and adapting the form of collaboration to the	Admission criteria for exam: Project report and process report must be submitted before the deadline set by the supervisors. The project report should be between 20-30 pages excluding appendices (1 page = 2400 characters including spaces).

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			Mechanics (MEC1), Material and Manufacturing Technology (MMT1) Product development set specifications in the form of requirements, criteria and properties and can use idea generation methods - unsystematic (e.g. Brainstorming) and systematic (e.g. Morphology). Presentationconvey technical knowledge in the form of drawings and calculations in a readable structured form Software Development with Java (SDJ1)use the knowledge acquired in SDJ1 Marketing Management 2 (MAM2)develop and prepare an international marketing plan including international market selection Intercultural Business Communication (IBC1)explain the importance of culture and intercultural communication in international business situations.	Own learning processdescribe and analyse own learning process in the process reportseek, find and incorporate relevant knowledgeset and reflect on own learning goals from current and previous semesters in the process report with a view to future improvement Project frameworkcommunicate the results of the project work and the project group's learning process in a structured way using professional concepts, both written, graphics and verbally.argue for the choice of sources and references in connection with the project work. Problem-based learninganalyze and explain overall contexts.work with a holistic view of the project, the subjects and the outside world.work interdisciplinary. Professional learning goals The students must be able to: Mechanics (MEC1), Material and Manufacturing Technology (MMT1)select and apply the syllabus from the subjectsuse idea generation tools in practiceapply skills from the subjects:compile free body diagramsperform equilibrium calculationschoose dimensions, design and functionalitychoose material and production methodsperform 3d modellingperform structured presentation of calculations Software Development with Java (SDJ1)explain the Waterfall method as a software development processderive requirementsapply use case modelling and draw activity diagramsdraw a domain modelconstruct class diagram(s)draw a sequence diagram of one essential methodimplement a software system using object-oriented programmingperform testing in relation to the derived requirementsdescribe how to use your system in a user guide Marketing Management 2 (MAM2)select a new market according the to international market screening modelmake an analysis of a market for the selected countrydevelop a marketing strategy for the companycomplete an international	members' personal and interpersonal competencies Own learning processindependently plan, structure and optimize own learning process on the basis of previous courses Project frameworkin collaboration with the group, to take responsibility for the work process in connection with report writing and presentation.use verbal, digital and graphic project presentation techniquesProblem based learningwork analytically, methodically and structured with the semester project in the project group. Project managementplan, adapt and optimize a project process with appropriate project management tools.account for the use of digital tools such as digital project management as well as digital tools and portals. Professional learning goals The students must be able to: Mechanics (MEC1), Material and Manufacturing Technology (MMT1)perform static calculationsselect correct material and manufacturing methodsprovide a structured presentation of drawings and calculations Software Development with Java (SDJ1)Demonstrate the connection between the different stages in software development Marketing Management (MAM2) select potential new export markets by conducting an international market screeninganalyse a foreign market, decide on a marketing strategy and implement an international marketing plan Intercultural Business Communication (IBC1)find, apply and evaluate literature and information in general about cultural practices in the relevant export marketprovide management with suggestions on cultural aspects to be considered when entering a new export market	The process report should be according to guidelines. Examination form: Group exam with individual assessment. Group presentation approx. 15 minutes followed by a joint examination with a joint discussion and individual question rounds for approx. 15 minutes per student including voting. Individual grades are given on the basis of an overall assessment of the submitted work as well as the individual's performance during the examination. Internal examiner. Permitted aids: All Re-examination: The internal examiner decides whether the student who has not passed the semester project must submit a revised project report or complete a new project. For students who have not passed the semester project, an information meeting will be held at the end of the spring semester. Here, information is provided on specific deadlines and detailed courses for the project work, just as new project groups are formed where possible in relation to the number of failed students in the individual semesters. Based on the feedback the students have received after the ordinary exam, either a new project must be prepared or the non-passed project must be revised. The project must be handed in by the agreed deadline before the spring semester. Examination is conducted around the beginning of the spring semester. When submitting a revised project report, the main supervisor can also decide that submission and examination will instead be carried out in connection with the coming re-examination period.

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
				marketing plan including recommendations to the company for a possible entry into the selected market Intercultural Business Communication 1 (IBC1)identify intercultural aspects on the selected export market that may influence the entry to the market.recommend which strategies should be used to build a good relationship with local partners and employees		
GBE-SEP4	Semester Project 4: Investment in renewable energy	5	*The student should be able to understand:*3D drawing (CAD)Software programming using Java & relational databasesThermodynamics and electric circuitsCapital investment calculations for product developmentProject methodology as well as project work skills	*The student should achieve the skills to:***All students:**Evaluate the financial elements of an investmentUse the project methodology based on the Engineering guidelines **Software engineering students:**Database operation (SQL)Java application **Mechanical engineering students:**Measure and calculate energy and power for solar energy systems	*The student should be able to:*The students will be able to identify and solve cross-disciplinary problems in a group projectThe students can handle both written and oral communication of project results	**Oral Examination** Individual oral examination without preparation based upon course assignment(s) Allowed tools: All Internal examiner Please note that re-examinations may take a different form than the ordinary exams. **Re-examination** Students who failed a semester project in January or June must attend an information meeting on the last Friday in June. At this meeting, the students will get information on specific deadlines as well as the process of re-exam. They will form new groups, if possible in relation to the number of failed students at the individual semesters. Based on the feedback, the students have received after the ordinary exam, they must prepare a new project, or the failed project must be improved. Deadline for hand in of the project is mid-August (exact date will be informed at the meeting). There will be no guidance in the period up to hand in. Oral assessment of the project takes place in September.

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
GBE-SEP5	Study Project: Free Innovative Product Design	10	Key dimensions of project management skills in groupsProject planningInnovation processApplied theory from selected technical specialization (ICT/ME)	Be able to generate ideas, develop concepts and make final systematic choices based on relevant requirements and criteriaBe able to choose theories, models and methods relevant to the problems in the projectBe able to design, dimension and document machines / software in accordance with rules and regulationsDemonstrate analytical, rational as well as innovative thinkingDemonstrate self-initiative, interpersonal skills, criticism, self-criticism, desire to learn.	Project management skillsDefine, manage and implement projects bridging technical and business issuesApply input from business/marketing part to technical solution and vice versaMake methodical decisions based on discussion and analysis of relevant models and theoriesFocus on the relevant issues to provide a coherent solutionDevelop technical solutions that both meet the needs of the market and have business potential.	The study project report must be handed in on time in order to enroll for the examination. The groups will present the business plan (15 min.) followed by a group examination covering both the technical and business subjects (approx. 45 min). it should be noted that the grading is still individual (not a group grade). The basis for the examination is the project report. The examination can sway the project grade up or down for individual students depending upon the performance.
GBE-SEP7	Semester Project - UN 17 Sustainable Development Goals and Environmental Social Governance	15	Students will achieve knowledge within the areas of:Key dimensions of project management skills in groups.Technical theory & methods from selected specialization (ICT/ME) relevant for the project in question.Business and cultural theories and methods relevant for the project in question.UN 17 Sustainable Development Goals.	After completion of the project, the students will be able to:Evaluate the relevance and importance of UN 17 SDG's in connection with business strategy.Apply relevant project methodology and project management tools in a cross-cultural context.Choose and apply relevant technical tools and methods from the selected specialization (ICT/ME) to solve a specific product development task.Outline an implementation plan for a project in a cross cultural context that fulfill the guidelines in UN's SDG no 17- Revitalize the global partnership for sustainable development.Apply the chosen second foreign language for research in an academic context.	After completion of the project, the student should be able to:Give recommendations to how attention to Environmental and Social Compliance and UN 17 SDG's in product and business development can be used in strengthening of the strategic positioning of a company.Identify and solve cross-disciplinary problems in a group project.Plan and implement a project plan in a cross-cultural context.Formulate a solid Project Description for the 9th semester Bachelor project.	**Oral Examination** Group presentation followed by an individual examination with the presence of the whole group. Duration presentation 15 - 20 minutes.**Allowed Tools: All. Internal examiner. The project report must be 30 – 40 standard pages (exclusive appendices etc.) and must follow the "Guidelines for Engineering Projects.**
GBE-SPA2	Spanish Business Language I	5	The students should have knowledge about/understand and reflect on:The Spanish language including basic grammar, sentence structure, vocabulary and pronunciationKnowledge about business and industry in Spain. Topics relating to business and industry in other Spanish-speaking countries can also be included	After the course, the students should be able to:Use relevant business terminologyRead and understand authentic texts in Spanish on issues relating to business and industryFind, use, and discuss information in Spanish on business subjectsMake presentations in Spanish on various subjectsPrepare simple texts in Spanish with special focus on the global business engineer's professional area.	After the course, the students should be able to:Communicate in Spanish in a clear language, orally and in writing, in international contextsFunction and cooperate with people with different educational, language, and cultural backgroundsStructure own learning in an effective way and critically acquire new knowledge within relevant engineering areasPut the knowledge of the language and the Spanish society and the Spanish-speaking countries into practice in an international context.	**Oral Examination** The examination is based on an unseen text and questions in relation to the topics of the course. All aids are allowed during preparation. External examiner. Please note that re-examinations may take a different form than the ordinary exams.
GBE-SPA3	Spanish Business Language II	5	After the course the students should have knowledge and reflect onthe Spanish language, including syntax, phonet-	After the course, the students should be able to:read, understand and discuss texts in Spanish on social, business and engineering issuesbe confident in using	After the course, the students should, to a high extent, be able to:communicate in a clear language, orally and in writing, in	**Oral Examination** The student is examined on the basis of:

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			ics, grammar, and semanticsSpanish industry and business lifeIntercultural affairs and business protocol in Spain and/or Spanish-speaking countriesHow to make presentations.	appropriate terminology within subject areas discussed in classnegotiate with Spanish-speaking cooperation partnersmake presentations in Spanishexpress themselves orally in Spanish with a rather high level of accuracy.	international contextsfunction and cooperate with people with different educational, language, and cultural backgroundsstructure own learning in an effective way and critically acquire new knowledge within relevant engineering areasput the knowledge of the language and the Spanish society and the Spanish-speaking countries into practice in an international context.	1) A presentation and discussion of a previously unknown text handed out prior to the preparation, and one or more questions to the course curriculum. OR a negotiation case where the student plays one part and the lecturer the other part, and one or more questions to the course curriculum. 2) A presentation of the semester project SEP5 (10 min. power point presentation). All aids are allowed during preparation. Please note that re-examinations may take a different form than the ordinary exams.
GBE-SSM1	Personal Selling and Sales Management	5	The different kinds of sales jobs and personal characteristics of successful sales personsUnderstand the significance of personal selling to the sales of the company, its relation to other the other elements of the promotion mix of the company and its marketing strategyThe connection between the purchasing behavior of the customer and the right sales strategyThe buying center concept and factors affecting the customer decision-making processProspecting: how to find new sales leads and methods to qualify them as potential customersA deep understanding of the key phases in the personal selling process:1. The opening at a sales meeting2. Need and problem identification3. Presentation and demonstration of relevant solution4. Effective techniques to deal with buyers' objections5. To negotiate a deal6. Techniques to close a sale (get the order)7. Follow-up on the sales meetingBasic knowledge about sales organization and sales administration including international aspectsDefine customer value from the buyers perspectiveHow to transform product features into customer benefitsBuilding, maintaining and extending customer relationshipsAwareness of ethical	Create a prospecting plan to find new customersPlan and design the sales meeting by finding and using relevant informationDetermine the members of the 'buying center', their needs and purchase motivationsHow to determine customer value and create a strong value propositionPrepare and present a sales presentation in a convincing mannerBe effective in sales negotiation and handling of objectionsBe able to close a saleManage customer relationships to maximize long term customer satisfaction	Be able to effectively prospect for new customersOverall to plan and conduct a professional sales meeting covering all the steps in the process from the opening over need and problem identification, presentation, handling of objections, negotiation, closing the sale to follow-up on the meetingPrepare and conduct a sales presentation: visual, verbal, and nonverbal communication of information using professional selling skillsUse an appropriate selling strategy according to the needs of the customer, the characteristics of the product in question, the competition and the objectives of the selling companyBe effective in building, maintaining and extending customer relationshipsFunction as the market expert regarding information on products and competitors to both the selling and the buying organization	Permit criteria for attending examination: Mandatory assignments handed in before deadline and accepted. Exam typeIndividual oral examination without preparation based upon course assignment(s)Internal examinerAllowed tools: None

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			practices in personal selling			
G-WS1	Workshop: Know Your Profession	0	The student must obtain knowledge about what job opportunities are available as a graduate and what requirements are set for these	The student must obtain sufficient knowledge about what the education can be used for so that decisions can be made about, among other things. stays abroad and electives	The student must be able to prepare a relevant and focused job application, pitch their profession and structure a career path	Admission criteria for exam: 100% deltagelse og aflevering:Deltagelse i virksomhedsbesøg og dimittend-workshopAfleveret relevant jobbeskrivelse, ansøgning samt videopitch Examination form: Approval based on handed in assignments Permitted aids: All Re-examination: None. A not approved course must be re-taken.
G-WS2S	Workshop: Software specialization	0				Admission criteria for exam: Full attendanceand hand in of all assignments Examination form: Approval based on handed in assignments Permitted aids: All Re-examination: None. A not approved course must be re-taken.
IT-BUI1	Business Intelligence	5	Students will obtain knowledge about understanding, reading, and presenting data from a dimensional model (such as a star schema or data cube) and other data models. • Knowledge about building data products for operational vs real-time systems	• Data migration using data integration tools • Create Data pipelines to cleanse data and move it into a data warehouse • Create KPIs and measures • Create data analyses, presentations and dashboards with Business Intellligence tools • Create data structures for analysis purposes with selected tools • Create, deploy and manage reports	•Evaluate pros/cons of different BI products, architectures and approaches	Exam prerequisites: In order for the student to qualify for the examination, the course assignment must have been handed in on time and approved. Exam type: Oral examination based on the course assignment. Approximately 20 minutes incl. discussion of examinee's performance, without preparation. Internal assessment.
IT-DAI1	Data Analytics Infrastructure	5	Having completed this course, students should be able to describe basic techniques within the field, and argue the choice and applicability of these for different use scenarios. This includes: • Application of analytical data processing, and differences to transactional processing • Types of analytical data processing, such as reporting and visualization	Having completed this course, students should be able to: • Design and implement data models for integrating multi-source data, including dimensional data modelling, for structured and semi structured data • Design and implement data models for time-variant data • Design, implement and test systems for data acquisition, validation, integration and delivery from multiple sources and	Having completed this course, students should be able to: • Discuss and argue pros, cons and trade-offs of choices • Use basic statistics and visualization to find and explain patterns of information in data • Evaluate and act upon peer feedback	Permit criteria for attending examination • Mandatory course activities completed • Course assignment handed in before deadline • The student must have an attendance of at least 75% in order to qualify for the exam. Students who do not have at least 75% attendance will automatically fail the ordinary

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			• Sources of data for analytical processing • Server and locally hosted platforms for data storage and analytical processing • Modelling techniques for designing data models for integration of multi-source data, including structured, semi-structured and unstructured data, and for modelling time-variant data/history • Design of systems for data acquisition, validating and cleansing data, integration and publishing of data.	platforms • Design, implement and test basic descriptive statistical analysis on integrated data • Design, implement and test basic visualizations and graphs of data and analysis results. • Give relevant peer feedback on handins and exercises throughout the semester		exam. Type of exam Individual oral examination without preparation based upon course assignment(s), covering mandatory course work and theory covered in the course. Duration (grading included) app. 20 min/ 5 ECTS. Allowed Tools: All Internal Examiner
IT-DAI1	Data Analytics Infrastructure (from S23)	5	Having completed this course, students should be able to describe basic techniques within the field, and argue the choice and applicability of these for different use scenarios. This includes: • Application of analytical data processing, and differences to transactional processing • Types of analytical data processing, such as reporting and visualization • Sources of data for analytical processing • Server and locally hosted platforms for data storage and analytical processing • Modelling techniques for designing data models for integration of multi-source data, including structured, semi-structured and unstructured data, and for modelling time-variant data/history • Design of systems for data acquisition, validating and cleansing data, integration and publishing of data.	Having completed this course, students should be able to: • Design and implement data models for integrating multi-source data, including dimensional data modelling, for structured and semi structured data • Design and implement data models for time-variant data • Design, implement and test systems for data acquisition, validation, integration and delivery from multiple sources and platforms • Design, implement and test basic descriptive statistical analysis on integrated data • Design, implement and test basic visualizations and graphs of data and analysis results. • Give relevant peer feedback on handins and exercises throughout the semester	Having completed this course, students should be able to • Discuss and argue pros, cons and trade-offs of choices • Use basic statistics and visualization to find and explain patterns of information in data • Evaluate and act upon peer feedback	Permit criteria for attending examination • Mandatory course activities completed • Course assignment handed in before deadline Type of exam Individual oral examination without preparation based upon course assignment(s), covering mandatory course work and theory covered in the course. Duration (grading included) app. 20 min/ 5 ECTS. Allowed Tools: All Internal Examiner
IT-DBS1	Database Systems	5	Having completed this course, students will be able to: • account for the relationship between relational algebra and SQL • define the relational model • distinguish the 3 normal forms • classify keys in relational databases • explain indexes	Having completed this course, students will be able to • use relational modelling to model business cases • use UML to document ER-Models • use Data Definition Language (DDL) to create databases • use Data Modeling Language (DML) to manipulate data in a database • use the mapping method to convert ER-Models to Relational Models • use normalisation to normalise a database schema to 3rd normal form	Having completed this course, students will be able to: • Design and implement a database schema on the 3rd normal form • Use a database in application development	Criteria to qualify for the exam: • Course assignments handed in before deadline • The student must have an attendance of at least 75% in order to qualify for the exam. Students who do not have at least 75% attendance will automatically fail the ordinary exam. Exam Duration: 4 hours Digital written exam (2 parts): Part 1: Multiple choice and written answers; 2 hours without aids

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
				• create SQL statements to create, replace, update and delete data in a database • use keys in relational databases • use joins to combine data • use transactions to prevent data corruption • create triggers • create views		Part 2: Design and implementation; 2 hours with all aids, including internet connection External assessment Allowed tools: Textbook, written or printed notes, and files saved to personal computer. Re-exam: Conducted as the ordinary exam.
IT-DIM1	Digital Multi Media	5			Having completed this course, students should have profound knowledge of: • Computer Graphics • Design Principles for multimedia • Video, Animation and Sound • XML and Multimedia	Evaluation is based on a written group course assignment, where it must be clearly marked which sections of the course assignment each group member contributed with. Furthermore, each group member must also hand in an additional 1-2 pages of individual reflections on the work they have done in the course assignment.
IT-DNP1	.NET Programming	5	The student will be able to:Identify the C# programming languageDescribe the fundamentals of .NET development and the common type systemDescribe how RESTful web services are implemented in a distributed systemIdentify and describe .NET technologies relevant to web application developmentDescribe how data can be accessed through object-relational mappingDefine basic authentication and authorization	The student will be able to:Write and debug C# codeNavigate and use the managed .NET APICreate and consume class librariesImplement console applications, web applications and web services withServer-side and client-side C#-programmingData persistence using object-relational mappingUser management, including authentication and authorizationConsume and expose RESTful web servicesDeploy .NET applicationsUse a command-line interface (CLI) toolchainCompare object-relational mapping to traditional data access techniquesExplain the difference between client-side and server-side programming	The student will be able to:Analyze and evaluate the relevance of .NET technologies when designing software applicationsDevelop .NET applications and services as a part of a distributed system, herein account for communication protocols used	**Written examination** Duration: 3 hours Programming exercises; with all aids, including internet connection Internal examiner Please note that re-examination may take a different form than the ordinary exam
IT-DNP1	.NET Programming	5	The student will be able to: - Describe the fundamentals of .NET development and the common type system - Identify and describe .NET technologies relevant to web application development	The student will be able to: - Write and debug C# code - Implement RESTful Web Services in relation to a distributed system - Consume RESTful Web Services - Utilize asynchronous programming - Create and interact with a relational database using an Object - Relational Mapping library - Define and implement basic authentication and authorization - Navigate and use the managed .NET	The student will be able to: - Implement a robust, error-safe system - Implement console applications, web applications and web services as part of a distributed system with - Server-side and client-side C#-programming - Data persistence using object-relational mapping - User management, including authentication and authorization - Analyze and evaluate the relevance of	Exam prerequisites: Course assignments handed in before deadline. The student must have an attendance of at least 75% in order to qualify for the exam Exam type: Individual written examination Duration: 3 hours Programming exercises Internal examiner Tools allowed:

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
				API - Create and consume class libraries - Compare object-relational mapping to traditional data access techniques - Implement a Web App within ASP.NET	.NET technologies when designing software applications - Apply best practices when developing .NET apps	All aids, including internet connection Re-exam: The re-examination may take a different form than the ordinary exam
IT-EOS1	Embedded Operating Systems	5	Having completed this course, students should be able to • Account for advantages and disadvantages of Linux as operating system in embedded systems. • Describe the anatomy of a 32-bit embedded system. • Describe the features of a BeagleBone system. • Describe the boot process of a 32-bit ARM based Linux system.Explain Pulse Width Modulation.Explain I2C communication bus technology. • Explain the structure of Linux file system and access permissions. • Explain how to connect and read input from sensors in an embedded Linux environment. • Explain how to connect and control actuators in an embedded Linux environment.	Having completed this course, students should be able to • Use basic Linux commands and utilities. • Select, install, configure and use tools needed for developing embedded systems. • Execute a firmware upgrade on a BeagleBone system. • Install and configure “off the shelf” software in Linux. • Use the GPIO structure in Linux to interface sensors and actuators. • Use Pulse Width Modulation for Control of servo motors, and LED light intensity. • Implement BASH scripts to control simple GPIO devices. • Implement simple hardware circuits for measurement and control. • Use appropriate programming language to implement web based user interface.	Having completed this course, students should be able toImplement shell scripts in BASHDesign and implement IoT-devices, based on a 32-bit MCU platform with Linux	**Oral Examination** Individual oral examination based upon a subject found by draw. No preparation. Allowed tools: Laptop Internal examiner.
IT-ERP1	ERP systems SAP ABAP/4 Programming	5	Having completed this course, students will be able to: - Understand the ABAP Workbench. - Create basic ABAP Programs. - Understand the control flow and structures in ABAP	Having completed this course, students will be able to: - Create Database with domains, data elements and tables - Retrieve Data from the Database with open sql. - Develop a simple ABAP Programs with modularization. - Develop a DYNPRO with navigation (CRUD-functionality) - Develop reports with selection screen, alv-list, etc.	Having completed this course, students will be able to: - Use the fundamental concepts of the ABAP programming Language - Create simple application programs with user dialogs and database connections. - Trace the flow of a program and troubleshoot simple problems. - Describe change management for new systems. - Use ABAP Workbench and basic ABAP language elements. - Explain the relationship and difference between the classical procedural programming model and the object-oriented programming model in ABAP/4. - Apply screen flow logic and working	Internal examination The evaluation of the course is based on mandatory course work (50%) and the oral exam (50%) at the end of the course. Only students with approved course work will be allowed to attend the exam. The exam is oral and it takes 20 minutes per student. The exam is in two parts. First part is a presentation and discussion of selected parts of the course work. Second part is drawn question from the theory of the course.

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
					with external data. - Apply different tools and techniques available to implement dataflow in an ABAP program with database. - Design and implement an object-oriented SAP application with a database and ALV Grid.	
IT-IDX1	Interaction Design	5			Gain skills within interaction design and usability evaluation. You will achieve: knowledge of and experience in User eXperience Design (UX)including knowledge of and experience in participatory design workshopsknowledge on planning, preparation, implementation, analysis, and documentation of user-based usability evaluationunderstanding of and practical experience with the interplay between usability evaluation and interaction design in an iterative design process	The exam is oral and it takes 20 minutes per student. The exam is in two parts. First part is a presentation and discussion of selected parts of the course work. Second part is drawn question from the theory of the course.
IT-LWA1	Internet of Things WAN's	5	After having completed this course, the students should have knowledge about: • IoT protocols • LoRaWAN network elements • LoRaWAN technologyLoRa device classesSensors/Actuators OTA (OverTheAir) activation • Personal activation • Radio Propagation/Antenna • SecurityIoT Testing	After having completed this course, the student should be able to: • Analyze and explain IoT LoRaWAN problems and their context • Select and argue for choice of methods and reflect critically on said methods • Find and assess relevant literature within the problem domain • Plan and present the result for an audience of engineers	After having completed this course, the student should be able to: • Assess and delimit a IoT project • Plan and structure the project within the set time limit • Predict the preliminary steps in an systems development process, leading to a clearly defined requirements capture, use cases, as well as object and behavior analysis • Work successfully in a project group with the objective of solving a well-defined engineering problem	Oral examination based on one mandatory assignment.
IT-MAL1	Introduction to Machine Learning	5	After having successfully completed the course, the student will have gained knowledge about algorithms, methods, techniques, tools, and applications within the following fundamental machine learning methods: - predictive methods, e.g. regression and classification - descriptive methods, e.g. clustering and PCA	After having successfully completed the course, the students should be able to apply the algorithms, methods and models from the above-mentioned areas to identify, analyse, evaluate and make suggestions for solving specific data-based issues. They must be able to argue for the relevance of the chosen algorithms as well as for the proposed solution. In addition, they must be able to	After completion of the course, the goal is that the students have acquired the competences to:- Make informed choices about the use of machine learning techniques - Parametrisise machine learning algorithms for a given data material - Design and develop a complete solution for a complex, realistic problem	The course is evaluated based on a 25 minutes oral examination. The examination will depart from the parts of the group assignment that the student is responsible for, and will evolve into a discussion of the syllabus in general. The oral examination does not include a presentation, meaning that the student does

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			- deep learning methods, e.g. neural networks. - clustering methods, e.g. partitional and hierarchal clustering The students must be able to relate critically and reflectively to the above topics; in particular, it is important that they become proficient in selecting the right type of machine learning method for use in a given context.	reflect on the importance of the context in which the solution is included. Specifically, it is expected that after completion of the course the students will be able to: - Understand and apply a number of machine learning algorithms to both unstructured and structured data examples - Understand and compare the algorithms behind different data mining and machine learning methods - Match and possibly combine methods for practical use in an appropriate context.	- Communicate and discuss the solutions with professionals and non-specialists.	not prepare or present a presentation. The student is given one grade based on the examination.
IT-PME1	Process Management for ICT Engineering	5	After successfully completing the course, the students will have gained knowledge about: • How to ensure quality in projects • How to improve your project performance • How to handle change management in a project.	After successfully completing the course, the student will be able to: • Apply techniques and results from Capability Maturity Model Integration (CMMI) to solve challenges in project processes • Apply techniques and results from Lewin model to handle change management in project • Apply "How to break software" to prevent making mistakes in your project • Be able to describe and make use of testing concepts • Use of terminology to kick-start Bachelor project.	To comlete this course the students must make hand-in: Requirement Specification - IEEE 830 standard" document for a projectTest Specification - IEEE 829 standard" document for a projectProject relations to CMMI model" document for a project.	The course is assessed on the basis of 3 individual assignments, weighing 25%, 30% and 45%, respectively. If the course is failed, the student must go for internal oral re-examination.
IT-RWD1	Responsive Web Design (up to and including S22)	5	Having completed this course, students will have the knowledge to: • Describe the different file formats used in web development and their purpose. • Reproduce webpage layouts using HTML5 and CSS3 when presented with images/screenshots of other websites. • Select appropriate attributes for HTML5 elements. • Explain the difference between responsive and non-responsive websites. • Test HTML5 files for errors using the W3C markup validator. • Account for the difference between the JavaScript and Java programming languages.	Having completed this course, students will have the skills to: • Create web sites using Hyper Text Markup Language (HTML5). • Use simple and advanced CSS3 selectors and properties to style webpages. • Apply the Bootstrap grid framework to create responsive websites. • Utilize the Bootstrap classes to apply styling to responsive websites. • Implement JavaScript functions to add functionality to websites. • Use XMLHttpRequest to read content from an external source and integrate this content into a website. • Select HTML elements and apply jQuery animations to the selected elements to make websites interactive.	Having completed this course, students will be able to: • Design and implement platform independent web applications.	Prerequisites for exam: If the following requirements are not met, the student will not qualify for the exam: The student must have an attendance of at least 75%.Mandatory assignments handed in before deadline and accepted. Exam type: Digital written examination duration of 2 hours (2 parts): Part 1: Multiple choice questions 30 minutes Part 2: Short answer questions 90 minutes (explaining and writing code) External assessment. Tools allowed: Part 1: without aids

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
						Part 2: all aids allowed - including internet connection Any types of communication between students or between a student and an external party is prohibited and will be considered a violation of the exam rules. Re-exam: Please note that re-examinations may take a different form than the ordinary exams.
IT-SDJ1	Software Development with UML and Java (from A22)	10	The student should be able to: • Identify the Java lexical structures: keywords, separators, operators, identifiers, literals and comments. • Explain details of UML class diagrams. • Identify selection and loop structures in UML activity diagrams.	The student should be able to: • Construct Java programs with proper choice of selection and loop structures. • Create and use objects in Java. • Implement classes in Java using the object oriented concepts: encapsulation, inheritance and polymorphism. • Implement one-to-one relations and differentiate between association, aggregation and composition. • Implement one-to-many relations using array structures and a simple collection class. • Implement exception handling for different types of exceptions. • Implement persistence in text and binary files. • Construct simple event-based GUI applications. • Construct Java source code documentations. • Interpret UML class diagrams, and construct corresponding Java code.	The student should be able to: • Exemplify and discuss basic object-oriented concepts, including encapsulation, relationships, inheritance and polymorphism • Implement small scale systems from UML class diagrams.	Prerequisitesfor exam: In order to qualify for the exam, the student must participate in an oral mid-term test half way through the semester. The date will be published at the beginning of the semester. If students fail to appear for the mid-term test, they must take the mid-term test on class in the first possible session. The student must have an attendance of at least 75% in order to qualify for the exam. Students who do not have at least 75% attendance will automatically fail the ordinary exam. Exam type: Individual oral examination where the student will pick an unfamiliar programming exercise at random. The student must explain the UML involved and demonstrate how to perform the programming task using a laptop. The time allotted for the examination is 30 minutes including assessment. Exam is with an external examiner. Tools allowed: All. Re-exam: Same as ordinary exam.
IT-SDJ2	Software Development with UML and Java 2	10	The student should be able to understand: • System architecture • Various methods for testing • Concurrent programming • Design patterns • Client/server structure	The student should achieve the skills: • Implement design patterns in Java • Test software using different testing techniques, including (but not limited to) JUnit testing, System testing, etc. • Implement thread-safe classes and multi-threaded programs • Make programs communicate using client-server technologies	The student should be able to: • Implement programs in Java using design patterns, and evaluate which to use • Test software using relevant testing techniques • Develop flexible java code using interfaces • Implement thread-safe classes and	Criteria to qualify for the exam: • Course assignments handed in before deadline • The student must have an attendance of at least 75% in order to qualify for the exam. Students who do not have at least 75% attendance will automatically fail the ordinary exam.

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
					multi-threaded programs • Implement client-server systems	Exam type: • Individual oral examination without preparation based upon course work. • The student will draw from a pool of previously known questions. • The student will explain concepts and theories from the course, using the course work as reference. • The student will start with a prepared presentation. • External assessment. Allowed tools: NA Re-exam: Conducted as the ordinary exam.
IT-SWA1	Single-Page Web Applications	5	The student should be able to • define dynamic and static languages • identify pitfalls of asynchronous programming • explain the JavaScript object model including prototype model • define functional programming • describe the methods for client/server programming • describe web sockets • explain reactive programming	The student should be able to applyuse object-oriented programming in JavaScriptuse functional programming in JavaScriptapply common design patterns to document object modelsuse callbacks and other higher-order functions for general programming in JavaScriptapply asynchronous programming using Promises to implement client/server programmingapply asynchronous programming using XmlHttpRequest to implement client/server programminguse web sockets to implement client/server communicationuse reactive programming including operators to implement client/server communication	At the end of the course, the students should be able tocompare methods of object creationcompare methods of inheritancerelate functional programming to imperative programming in JavaScriptcompare patterns of GUI programmingcompare use of request/response, web sockets and reactive programmingdesign and implement single-page application using JavaScript, web services, asynchronous programming, and client/server communication patterns	Oral examination based on a question from the course syllabus based on the course assignment. Approximately 20 minutes (including discussion of examinee's performance) without preparation. Internal exam.
IT-SWE1	Software Engineering (IT-)	5	The student should be able to account for: • Abstraction • UML (selected diagrams) • S.O.L.I.D principles • Unified Process • Scrum • Design principles • Architectural design • Requirement capturing • Analysis vs. Design models • The difference between software development and coding • Test descriptions	The student should achieve the skills to: • Analyse a problem and document the analysis- and design-process with text and UML • Apply use of Scrum • Apply use of Unified Process • Use UML to document requirements, analysis, and design artefacts • Use agile software development with Unified Process in combination with Scrum • Create a Domain model from a problem description, requirement specification and understand the elements in the resulting Domain model	The student should be able to: • Analyse a problem– what is the problem to be solve? • Derive a requirement specification with Use Cases and non-functional requirements • Plan tests by Test specifications • Analyse and design a project to be implemented in teams with many participants and stakeholders • Work in a Scrum team	Criteria to qualify for the exam: • Course assignments handed in before deadline • The student must have an attendance of at least 75 % in order to qualify for the exam. Students who do not have at least 75 % attendance will automatically fail the ordinary exam. Exam type: Internal assessment. IF you are full degree Software Engineering student: • SWE 1 is evaluated together with SEP 2 project.

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment

			• How to conduct a test following a test description	• Create a design model and understand the elements within it
				• Apply the S.O.L.I.D principles on a design model
				• Design for test
				• Create test descriptions
				• Create architectural design models
						• The SEP 2 project and the exam must demonstrate understanding of SWE 1 skills and competencies and their use in practice.
						During the SEP 2 exam, specific SWE 1 questions will be asked
						ELSE
						Individual oral examination without preparation, where 50% of the grade is based on examination of one or more course assignments and 50% of the grade is based on a drawn question.
						ENDIF
						Allowed tools:
						All
						Re-exams:
						Individual 15 minutes oral examination without preparation, where 50% of the grade is based on examination of one or more course assignments and 50% of the grade is based on a drawn question. The questions will be known before the examination.

IT-WEB1	Web Development (from A22)	5	Having completed this course, students will have the knowledge to: • Describe the different file formats used in web development and their purpose. • Reproduce webpage layouts using HTML5 and CSS3 when presented with images/screenshots of other websites. • Select appropriate attributes for HTML5 elements. • Explain the difference between responsive and non-responsive websites. • Test HTML5 files for errors using the W3C markup validator. • Account for the difference between the JavaScript and Java programming languages.	Having completed this course, students will have the skills to: • Create web sites using Hyper Text Markup Language (HTML5). • Use simple and advanced CSS3 selectors and properties to style webpages. • Apply the Bootstrap grid framework to create responsive websites. • Utilize the Bootstrap classes to apply styling to responsive websites. • Implement JavaScript functions to add functionality to websites. • Use XMLHttpRequest to read content from an external source and integrate this content into a website. • Select HTML elements and apply jQuery animations to the selected elements to make websites interactive.	Having completed this course, students will be able to: • Design and implement platform independent web applications.	Prerequisites for exam: If the following requirements are not met, the student will not qualify for the exam: The student must have an attendance of at least 75%.Mandatory assignments handed in before deadline and accepted. Exam type: Digital written examination duration of 2 hours (2 parts): Part 1: Multiple choice questions 30 minutes Part 2: Short answer questions 90 minutes (explaining and writing code) External assessment. Tools allowed: Part 1: without aids Part 2: all aids allowed - including internet connection Any types of communication between students or between a student and an external party is prohibited and will be considered a violation of the exam rules. Re-exam: Please note that re-examinations

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
						may take a different form than the ordinary exams.
IT-WEE1	Web Engineering Processes	5			Having completed this course, students should have a solid knowledge about:The process of developing Web applicationsCreating Web applications with database connection in ASP.NET and C#	Oral examination. Approximately 20 minutes (including discussion of examinee's performance). Based on a presentation and discussion of the course project.
ME-AEM1	Advanced Engineering Mathematics	5	After completing this course the student must know: * How differential equations are used in the modelling of physical phenomena including: mixing problems; the forced harmonic oscillator; the elastic beam; 1D and 2D wave equations; the heat equation * The key concepts in the theory of ordinary differential equations (ODEs) and their solution including: direc-tional fields; linear, separable, exact ODEs; linear ODEs and systems of linear ODEs w. constant coefficients; phase plane methods, linearization * The key concepts in vector calculus including: gradient, divergence, curl; line, surface and volume integrals; Gauss divergence theorem; Stoke's theorem * The key concepts in the theory of partial differential equations (PDEs) including: principle of superposition; boundary conditions; separation of variables; Fourier solutions * The key concepts in the theory of Fourier analysis including: Fourier series and integrals; expansion of even/odd functions	After completing this course, the student must be able to: * Recognize and solve different types of ODEs * Apply the most important differential operators * Evaluate multi-dimensional integrals of vector functions also using integral transformation theorems * Calculate Fourier series and integrals * Recognize different types of PDEs and boundary conditions * Solve PDEs using Fourier analysis	After completing this course, the student must be able to: * Recognize physical phenomena and engineering problems where ODEs and/or PDEs are needed for mathe-matical modelling. * Perform such mathematical modelling in simple cases and solve the resulting equations. * Use sources of information that apply the language of ODEs, vector analysis, and PDEs in either a job situa-tion or in the context of further studies.	<u>Requirements for attending examination</u> No requirements <u>Type of examination:</u> Written 4 hours. Censor: Internal <u>Allowed tools:</u> All <u>Re-examination:</u> Please note that the school can decide that the re-examination can be oral.
ME-AUC1	Automatic Control	5	After the course, the student has knowledge of • The structure and elements of a control system • Selection of controller (P, PI, PD, PID), and determination of controller parameters • Control strategies (simple feedback, cascade feedback, feed forward) • Analytic (Bode plot, Root locus) and experimental controller (process reaction/ sustained oscillation) tuning • Static and dynamic response	After the course, the student can describe a technical system, select a proper control strategy, and estimate automatic controller parameters, taking reference tracking, disturbance rejection, stability and dynamics into consideration.	After the course, the student has competencies to analyze a minor technical system, to specify control requirements, and select control strategy and controller.	Requirements for attending exam Mandatory course activities completed <u>Type of examination:</u> Individual oral examination (app 20 min) based upon a subject found by draw. Preparation time 20 minutes. Examinations account for 100 % of final grade Censor: Internal <u>Allowed tools:</u> Course literature according to the course description, Personal

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			• Reference tracking and disturbance rejection • Analysis of closed loop response, using mathematics and using simulation • Logic control • Specification of on-off control, using Grafcet diagrammes • PLC programming			notes, Laptop, Calculator <u>Re-examination:</u> As ordinary
ME-CAD2	Advanced Designing in 3D-CAD	5	The student will acquire knowledge and become confident with the use of the software Autodesk Inventor on a more advanced level. Most of the following topics will be covered: Sheet Metal Parts and Assemblies (Family members) – based on parameters Features and feature reuse Use of Content Center Publishing to the Content Center Assembly Functions and assembly reuseFrame Generator Weldment - design and documentation Plastic Design Surface Technology and Advanced Modelling Dynamic Simulation Design Accelerator (optional)Rendering and animation (optional)Manufacturing and CAM Programming incl lab exercises (optional)	The student will gain skills to handle and use a 3D CAD system in an engineering professional way and will be able to understand and select relevant tools and technologies	Use and Understand the role of 3D CAD technology in a deeper context regarding the interface and link to Manufacturing, Value Chain Management and Product Data Management.	Prerequisites for exam: Mandatory assignments handed in before deadline and accepted by the lecturer. Course assignment handed in before deadline. Any tests in laboratory accomplished and accepted. Exam type: The evaluation is divided into 2 stages: The first stage (counting 40%) is based on a 2 hour test in the usage of the CAD software. The second stage (counting 60%) is the evaluation of the final and group based course assignment. To pass the course both stages must be passed with a minimum of 30% approved. Censor: None Tools allowed: All Re-exam: Same as ordinary.
ME-DIG1	Digitalisation 1	5	The student will acquire knowledge of the following: • The user interface and understanding of the structure in a 3D CAD-system • Use sketching, constraints and dimensions as basis for 3D features • Create geometrical features • Create assemblies • Create and edit 2D drawings for parts and assemblies • Use of CAD in Maker Space • Recognize and identify datatypes • Data acquisition with different sensors	The student will acquire skills in: • Create 3D parts and assemblies in a 3D CAD-system • Assemble and document parts on a 2D drawing • Use digital twins in connection with 3D printers og CNC machines • Recognise and identify datatypes • Write, test and document simple scripts for controlling a microcontroller • Data acquisition • Use of sensors and actuators	After completing the course the student will be able to: • Use a 3D CAD program • Account for data flow and relate it to microcontroller systems • Design and implement simple circuits with microcontrollers, sensors and actuators.	Prerequisites for exam: Mandatory assignments approved by the teachers. Exam type: Individual written examDuration is 2 hoursThe exam counts for 100% of the final gradeInternal censor Tools allowed: All Re-exam: Same as ordinary

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			• Use of actuators in automatic processes • Basic knowledge about I/O as well as ADC and DAC			
ME-DYN1	Dynamics 1	5	The student will acquire knowledge of: • SI units • KinematicsForce and acceleration Linear momentumMechanical energyRotation of rigid bodies about a fixed axis	The student will acquire the following skills:Consistent use of units and unit conversionUse kinematical terms to describe motion of particlesAnalyse dependent motionDraw free body diagramsSet up and solve the equations of motion for particles and systems of particlesDescribe the concepts of kinetic energy, work and potential energy and use these to solve problems in particle dynamicsWrite structured Mathcad script to solve problems in particle dynamicsSolve simple problems with rotating rigid bodies	The student will be able to:Identify which parts of the acquired knowledge and skills are relevant for a given real world mechanical problemModel mechanical systemsUse the acquired knowledge in more advanced courses	Prerequisites for exam: Mandatory assignment in Mathcad. If the assignment is not handed in and approved by the deadline set by the teacher, an exam attempt has been used. A new assignment and deadline will be set before the reexam. Exam type: Written 4 hours. If the student prepares their solution by hand he/she must scan the solution at the end of the exam. Scanners will be provided. Tools allowed: All usual Re-exam: The school can decide to conduct the reexam as an oral exam
ME-ELE1	Electrical Engineering	5	After the course, the student can expound: • Simple DC and AC circuits (complex impedance, current and voltage, phasor analysis, load reduction and complex power) • Single and three phase AC systems • Single phased transformers • Three phase systems and the power grid, power in balanced systems • DC motors, types and speed control • AC motors: o Construction, temperature and isolation classes, thermal protection, contactors o Start of motor, load types, start methods, start restrictions, DOL start, Y-D start, soft starters and frequency converters.	After the course, the student has acquired skills in: • Analysis of DC and AC systems included in mechanical system • Loads Analysis	The student has acquired competence in selecting and dimensioning the electrical part of mechanical drivelines.	<u>Requirements for attending examination</u> None <u>Type of examination:</u> Individual oral examination where the student must explain how to solve a given problem. The problems are known in advance Individual oral exam based on solving a problem found by drawing lots. The duration is approx. 20 minutes. No preparation time for the exam. The exam papers are handed out at least one week before the exam. The exam counts 100% of the final grade. Internal Censor <u>Allowed tools:</u> None, however the course textbooks will be available in the examination room

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
						Re-examination: As ordinary
ME-EMI1	Experimentation, Measurements, Instrumentation	5	After the course, the student has knowledge of - General characteristics of measurements systems - Instrumentation - Statistical analysis of experimental data - Experimental uncertainty analysis - Logic control - Specification of on-off control, using Grafcet diagrammes - PLC programming	After the course, the student has the following skills: - Identify fundamental error sources - Read data sheets - Perform parameter estimation - Data analysis (eg. parameter estimation, regression, t-test and anova) - Uncertainty analysis - Plan and document an experiment - The student understands hardware in on-off control systems - The student can specify the operation of the system. - Further, the student can develop the control for a system, including system operation and safety.	After the course, the student has competencies to - find proper sensors and instruments - plan and document an experiment (Definition of problem, Design of test system, Construction, Data collection, Data analysis, Interpretation and Reporting) - Design a complete on-off control for a machine, using typically a PLC as controller.	Requirements for attending examination Course assignment handed in before deadline Type of examination: Group presentation followed by an individual examination with presense of the whole group Censor: Internal Allowed tools: Course literature according to the course description Personal notes Laptop Calculator Re-examination: As ordinary
ME-ENE1	Renewable energy	5	The student will acquire knowledge in, – Energy savings – Thermal solar heating and simulating of energy storage systems using TRNSYS 17 – Other thermal energy system (Packed-bed storage, storage wall and phase change energy storage) – Biomass and biogas – District heating and district heating network – Geothermal energy Renewable energy management (e.g. tax structures, costs for energy production, cost analyses, environmental issues)	Analyse the consumption of town or building and evaluate possible energy savings. Calculate the energy production from renewable sources with the integration of various energy storage scenarios. Calculate the eventually needs for supplementary fossil fuel production and the saving of CO2 emission.	The student will be able to communicate with students, engineers and companies about renewable energy and outline proposals for renewable energy supply.	Requirements for attending examination Course assignments account for 40 % of final grade; it is divided into 20% for 2 assignments and 20% for 1 mini project. The final exam will count 60%. The final exam divided into: a. Oral evaluation on the mini project (30%) b. Additional question from draw on the spot (30%) Type of examination: Individual oral examination based upon a subject found by draw and mini project discussion. Censor: Internal Allowed tools: None Re-examination: Course assignments account for 40 % of final grade while the final re-exam count 60%. The students might asked to do new mini project if required, improve the already submitted one or keep it without improvement.

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ME-IDP1	Innovation and Design of Products	5	Upon the completion of the course, the student will acquire knowledge:To define human-centered design.To describe user experience (UX) design methods.To identify the fundamental ergonomics aspects in good product design.To find, characterize and select the most relevant methods/ tools for user needs identification, acquisition and interpretation.To identify and choose between different design approaches.To define and formulate customer value proposition.To classify, interpret and implement business models for product design.To reason system interconnectedness exploration is essential in design thinking.	Upon the completion of the course, the student will be ableTo extensively apply User Experience (UX) design methods throughout a design project.To implement correctly the selected methods/tools (e.g. Von Hippel, function analysis, think-aloud, role –play, mood board, etc.) to achieve their designated goals for data analysis/synthesis from the product redesign and human-centered design perspectives.To relate, evaluate, and reason the key findings derived from the various undertaken analyses and syntheses.To identify and translate user needs to product design requirements.To assess solution propositions from business, risk and functionality perspectives (e.g. DeBono, HOQ, 6D's of exponential technology).To implement disruptive thinking to reflect on design solutions and to reframe design problem	Upon completion, the student will be familiar with and be able to implement Design Thinking models to start, plan, innovate, and complete a design project to a conceptual level by taking into account the relevant multiple aspects including system thinking and sustainability, user experience and business innovation	Prerequisites for exam: Completion, in compliance with the Design Thinking model, of a group basis design project. Group-basis submissions by the specified deadline: to summarise the design project outcomes in 3 posters (A-2 size setting), 3 standard pages synopsis text (single spacing, Times New Roman, font-12), a 2-minute pitch video (MPEG-4 format), and 1 one-pager (template will be provided). The tested (and refined) prototype shall be brought to the examination. Exam type: Oral groupexamination in two sessions: 15 minutes of group presentation presenting the submitted posters and tested prototype.With the presence of all other group members, 15 minutes individual oral examination based upon the submissions and an additional question drawn during the examination session. A list containing the additional questions will be accessible to the students at minimum one week in prior to the examination date. Examination counts for 100% of the final grade. Internal censor Tools allowed: The group-basis submissions and the tested (and refined) prototype. The lecturer will provide at the examination the additional questions list for reference purposes. Re-exam: Same as ordinary examination.
ME-MAT1	Mathematics 1	5	After completing the course, the student can:Explain limits of simple expressionsDescribe the meaning of a functions derivativeReproduce rules for derivatives, including the chain ruleExplain the meaning of partial derivativesExplain the connection between definite integrals	After completing the course, the student can:Find limitsCalculate derivatives using standard differentiation rulesCalculate partial derivativesDetermine characteristics of curves, including tangent vector, normal vector and curvatureCalcu-	After completing the course, the student must be able to: Use the covered methods in other courses when appropriate. Read texts that use the notation and concepts covered.	Prerequisites for exam: None Exam type: Written exam Duration is 4/6 hours Grade is exclusively based on the

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			and areas under and between graphsIdentify order and type of ordinary differential equationsExplain the use of polar coordinatesExplain how the complex numbers is an extension of the reals	late indefinite integrals, using substitution and integration by parts when appropriateDetermine definite integralsConvert between Cartesian and polar coordinatesApply complex numbers, including conversion between different representations		exam External censor Tools allowed: All usual, but no communication and no use of the web during the exam Re-exam: Same as ordinary
ME-MEC1	Mechanics 1	5	The student acquires knowledge of basic statics within the following: • Description and calculation of force systems, forces, moments, couples and resultants. • Formulation and description of static equilibrium, supports, free body diagram and equilibrium conditions. • The application of join method and section method applied to plane trusses, force calculation in frames and machines. • Definition and calculation of distributed loads, area centroid, external loads on beams, and internal forces in beams. • Identification and formulation of equations for normal force, shear force and bending moment. • Analysis of relationships between load, shear force and bending moment. • Use of cross-sectional constants and material strength values in dimensioning. • Identification and calculation of normal stress, shear stress, Von Misses stress and allowable stress. • Description of dry friction.	The student who completes the course acquires skills in: • Making free body diagrams and formulate static equilibrium equations. • Calculate reactions and determine internal forces in simple structures, which are statically determined. • Dimension and design simple structures and choose materials based on the material's strength values. • Provide calculation documentation in a technical report.	After the course, the student must be able to: • Perform analysis of mechanical loads as a starting point for the design and dimensioning of a simple product. • Be able to take part in projects concerning simple design and dimensioning tasks.	Prerequisites for exam: None Exam type: Individual oral exam based on solving an assignment found by drawing lots. The duration is approx. 20 minutes. No preparation time for the exam. The exam assignments are handed out at least one week before the exam. Exam counts 100% of the final grade. Internal censor Tools allowed: None, however, the course textbooks will be available in the exam room. Re-exam: As ordinary
ME-MEC2	Mechanics 2	5	The student acquires knowledge of mechanics in the following:Definition and determination of mechanical stresses and strains in materials.Analysis of planar stresses at combined loads, including the use of Mohr`s Circle.Use of Static yield and fracture criteria in dimensioning.Analysis of deformation in structures and calculation of statically indeterminate structures.Analysis and calculation of columns	The student who completes the course acquires skills in:Defining and determining the stresses and the strains by axial load, torsion, bending and shear of a structure.Analyze planar stresses in structures with a combined load, both when calculating and when using Mohr`s Circle.Dimension static loaded machine structures including determine the safety to static yield and fracture.Determine the deformation of beams by integration of the beam differential equation and using superposition based on values from tables.Calculate reactions in statically indeterminate structures.Dimension simple centrally loaded columns.	After the course, the student must be able to:Analyze, evaluate and document a mechanical design in relation to its strength. In addition, the student will have the competence to develop his or her knowledge and skills in mechanics.	Prerequisites for exam: Tests in the laboratory and associated report of app. 3-4 pages have been completed and approved. The work must be carried out in groups of approx. four students. The scope of the work is approx. 6 hours per student. <u>Exam type</u>: Individual oral exam based on solving an assignment found by drawing lots. The duration is approx. 20 minutes. No preparation time for the exam. The exam assignments are handed out at least one week before the exam.

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
						Exam counts 100% of the final grade. External examiner. Tools allowed: None, however, the course textbooks will be available in the exam room. Re-exam: As ordinary
ME-MEM1	Machine elements and design of machines	5	The student will gain knowledge of machine elements and machine design to be able toExplain the theoretical calculation basis for dimensioning of shafts as well as bolted and welded joints.Explain principles of gears, torque conversion and power loss in mechanical transmissions.Explain the parameters that form the basis for dimensioning and selection of machine elements such as screws, bearings, shaft / hub connections, couplings, clutches, gears, belts and chains in a machine construction.Identify and explain the working principles and technical solutions for designing machines.	The student who completes the course acquires skills in:Analyze loads, simplify and decide calculation models for dimensioning of machines and machine elements.Calculate, dimension and design shafts, including determining safety against yielding and fatigue.Calculate, dimension and design simple bolt and weld joints.Dimension, select and implement suitable standard machine elements such as bearings, bearings, shaft / hub connections, couplings, clutches, gears, belts and chains for a machine construction.Prepare layout drawing and drawing documentation using geometric tolerances and standard components in CAD.Use Mathcad or equivalent digital tool for calculation documentation.	After the course, the student must be able to:Set up possible solutions for the design of machine systems, based on specific requirements / criteria and assess which solutions are best suited. Including choosing solutions that ensure minimal environmental impact.Find the necessary knowledge in catalogs and technical literature regarding machine elements/components as well as interpret and apply this knowledge in connection with machine design.In addition, the student will have the competence to develop his or her own knowledge and skills in machine design.	Prerequisites for exam: Course assignment submitted before deadline. Exam type: Oral group exam without preparation based on the course assignment. Duration for 2 students approx. 30 min. incl. 5 minute group presentation. Incl. assessment. Exam counts 100% of the final grade. External Examiner. Tools allowed: All Re-exam: As ordinary
ME-MMT1	Materials and Technologies	5	After completing the course, the student will be able to: • Explain metals' mechanical properties • Explain the increase of strength in metals • Explain the relation between deformation, stress and fracture in tension loaded materials • Explain materials' failure • Explain forging • Explain assembly and fastening • Explain machining • Explain fast prototyping • Explain cost price and calculation • Explain greenhouse effect • Explain circular economy and the sustainable circles • Explain and make a simple life cycle analysis • Explain United Nations Sustainable Goals • Use Edupack program	After completing the course, the student will gain skills in: • Select an appropriate type of steel for manufacturing of components. • Select an appropriate strength increasing method. • Perform common tests for materials. • Select suitable technological processes based on production volume, geometry, surface requirements, tolerance requirements, load situation, etc. in relation to environmental impact and the sustainable principles. • Explain the function of different types of production equipment. • Estimate the cost price of products. • Perform a simple life cycle analysis of a product. • Use Edupack program for selection of materials and technologies	After the course, the student must be able to: • Select suitable materials and design components based on their mechanical properties as well as their manufacturing and machining technologies in relation to the sustainability principles. • Furthermore, the student must be able to independently apply, assess, and acquire new knowledge within the subject.	Prerequisites for exam: The laboratory report must be submitted on time and must be approved by the lecturer. Exam type: Individual oral exam, without preparation. Duration approx. 25 minutes Exam counts 100% of the final grade Internal co-examiner Weighting: The material part and the technology part each weigh 50% of the total grade. Tools allowed: All Re-exam: As the ordinary exam

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
ME-PWS1	Workshop: Turning and Milling	0				
ME-PWS2	Workshop: Welding, cutting and bending	0				
ME-SIT1	Simulation of Injection Moulding of Thermoplastics	5	Upon completion of the course, the student should be able to: - Explain the use of Moldex3D in order to design proper parts and moulds for injection moulding. - Explain in which way the model geometry influences the injection moulding process. - Outline which parameters can be adjusted for an optimal injection moulding. - Indicate the necessary data for the injection moulding.	Upon completion of the course, the student should be able to: - Use Moldex3D for parts and moulds analysis, for optimisation of parts and injection moulding process.	Upon completion of the course, the student should be able to: - Optimise plastic part and mould design by using advanced injection-moulding simulation.	Requirements for attending examination Mandatory course activities completed Type of examination: Individual oral examination based on a forehand given assignment. -No preparation -Internal censor Allowed tools: None Re-examination: Please note that re-examinations may take a different form than the ordinary exams.
ME-SMC1	System dynamics, Simulation and Control	5	Formulation of system equations for technical systems (mechanical, electromechanical, hydraulic, pneumatic and thermal systems) • Solution of linear differential equations, using Laplace transformations • Application of transform concepts to engineering systems (transients and frequency response) • Analysis of systems using Laplace transform and simulation • Numeric methods for simulation (using for example MatLab) • Simulation of engineering systems using Simulink. • Planning and interpretation of simulation • Logic control • Specification of on-off control, using Grafcet diagrammes • PLC programming	The student can formulate models of technical (mechanical, electromechanical, hydraulic, pneumatic or thermal) systems, analyze the static and dynamic behavior in time do-main and frequency domain, and simulate with MatLab / Simulink. The student understands hardware in on-off control systems and can specify the operation of the system. Further, the student can develop the control for a system, including system operation and safety.	The student can develop and analyze dynamic Mechatronic models. The student can design a complete on-off control for a machine, using typically a PLC as controller.	Requirements for attending examination - Course assignments for examination (30 hours) Type of examination Individual oral examination without preparation based upon course assignment(s) Examinations account for 100 % of final grade Censor: Internal Allowed tools Course literature according to the course description, Personal notes, Laptop, Calculator Re-examination As the ordinary examination
ME-SPP1	Sustainable Power Production	5	The student will acquire knowledge in 1. Photovoltaic cells and batteries 2. Fuel cell and hydrogen storage	Use the WAsP computer program to estimate annual power production for a wind turbine or a group of wind turbines	The student will be able to carry out study project in the area of sustainable power production and to participate in	Test + mini-project with individual oral exam 1 test have a weight of 30% The mini-project is weighted with

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
			3. Smart grid 4. Wind energy 4.1 Wind resources 4.2 Rotor blades for a wind turbine 4.3 Terrain classification, Roughness and orography 4.4 Wind turbine generator 4.5 Wind farm 4.6 Wind turbine transformer and electrical grid 4.7 Cooling system in wind turbine 4.8 Wind turbine components materials	(Wind farm) and Q blade software for wind turbine blades design. Calculate the power output of photovoltaic cells installation with energy storage. Be able to select between different energy storage scenarios.	projects in corporation with experienced engineers.	35% and the oral exam is weighted with 35%. Intern assessment Re-examination: As ordinary
ME-TDE1	Technical Design	5	The student will acquire knowledge of the following: - Sketching of isometric views and doing simple developments - Using 3d CAD in technical drawing - Illustrating using the first quadrant method (European) - Dimensioning after known standards (DS/ISO 128, 129) - Using tolerances in relation to assemblies - Combine surface roughness with production methods - Weldment sections in relation to weld symbols - The use of geometrical tolerancing when design machine components - Structured drawing documentation (layout, assemblies, detail drawings and parts lists)	The student will acquire skills in: - Presenting technical documentation in 2D and 3D - Creating machine drawings according to DS/ISO 128/129 and using general tolerancing and fit tolerances - Define an describe machine components making sketches, drawings, assembly drawings and parts lists. - Identify and using standard parts in machine design	After completing the course, the student will be able to: - Present and sketch technical ideas - Construct a product from described criteria's - Argue technical solutions in a dialog with suppliers - Produce technical documentation for production - Understand production preparation of raw materials and have a dialog about production methods	Prerequisites for exam: All 14 mandatory assignments must be approved by the teacher. Exam type: Individual oral exam without preparation based on the final course assignment uploaded to Wiseflow.Duration is 20 minutesThe exam counts for 100% of the final gradeInternal censor Tools allowed: All Re-exam: Same as ordinary
ME-TER1	Thermodynamics	5	Describe, construct and interpret a thermodynamic system. Apply and understand the main laws and fundamental concepts of thermodynamics. Calculate and depict processes for ideal gas and water vapour. Apply elementary flow theory for calculations and dimension of pipe systems and pumps. Calculate and dimension heat exchangers/heat transmission. Calculate main data for plants that use water vapour for production of power and heat.	Analyse a thermodynamic system and select relevant theory in order to enable the student to calculate variables and main capacities for the system. Use the thermodynamic calculation as basis of calculation of geometric dimensions for the system or selection of components. Use EES software for thermodynamic calculations	The student will be able to identify energy aspects in mechanical projects and solve simple thermodynamic problems and/or communicate with engineers and companies about energy aspects.	<u>Requirements for attending examination:</u> None. <u>Type of examination</u>: 4 hours written exam, electronic hand-in – no scanner provided Course activities (2 tests and approximately 7 hand-ins) account for 30%, final exam for 70%. External censor <u>Allowed tools:</u> All <u>Re-examination:</u> Please note that the school can decide that the re-examination can be oral.
ME-TMT1	Thermoplastic Materials	10	The student must gain knowledge about:	After the course, the student must be able to:	Upon completing the course, the student is expected to participate in development	<u>Requirements for attending examination</u>

Code	Title	ECTS-point	Knowledge	Skills	Competencer	Exam Prerequisites and assessment
	and Technologies		**Polymeric materials:** o Definitions o Types o Properties o Data sheets. **Technologies:** o Injection moulding o Extrusion o Thermoforming o Surface treatments o Joining methods o Other technologies. **Design methods and rules regarding relevant technologies.** **Injection moulding tools:** o Design o Materials o Manufacturing o Functions. **Sustainability** o Recycling o Circular economy o Biodegradability.	- Select polymers according to their physical and chemical characteristics, for either producing new products or replacing products made of other materials. - Design polymer products according to specific rules related to the relevant technologies. - Select relevant technologies with respect to function, economy, and sustainability. - Understand the function of, and design simple injection moulding tools. - Estimate the cost of injection moulded products. - Evaluate a product's sustainability.	tasks covering evaluation, design, and improvement of polymeric products, having in mind economically feasible technologies, tooling, and sustainability. Furthermore, the student should be capable of seeking, validating, and implementing additional knowledge within the subject by own hand.	Course assignment handed in before deadline. <u>Type of examination:</u> Oral group presentation of the course assignment (approx. 10 minutes) followed by an individual examination (approx. 15 minutes per student) with the presence of the whole group. Two tests during the course account for 30%, final exam for 70%. Internal examiner. <u>Allowed tools:</u> All <u>Re-examination:</u> Same form as ordinary exam and accounting for 100% of the grade (course tests not taken into account).