UNIVERSITY OF SOUTHERN DENMARK

Chapter 9

The programme specific part of the curriculum for:

Diplomingeniør i Interaction Design
Bachelor of Engineering in Interaction Design

Curriculum 2014, Version 1.0

Applicable to students admitted September 2014 onwards

The curriculum is divided into general provisions (Chapters 1-8), a programme specific part (Chapter 9) and the module descriptions for the subjects studied for each programme. Students should familiarise themselves with all three parts in order to acquire a full overview of the rules that apply throughout the study programme.

§1 Job Profiles

Interaction Design is a unique combination of industrial design and engineering. The graduate has particular competitive skills, as he/she:

- Masters the many aspects of the design process through the entire course of development
- Understands to emphasise the users
- Seeks holistic and realisable solutions
- Is capable of using the technical opportunities to the benefit of the users
- Understands to include economic and market-related aspects in the final solution

These core competencies give wide job opportunities:

- Design projects
- Product development
- Customer/marketanalyses and sales
- Strategic projects with customer segmentation and product portfolio
- Link in the team work from customer to development, manufacture, delivery and service
- Consultancy

The study programme highlights mechatronic products; still there are job opportunities within other fields.

§2 Competency Description of the Study Programme

The study programme enables the students to be able to design and develop innovative, user oriented and interactive products, emphasising human beings.

Knowledge:

A. Development based knowledge of theory, methods and practice used to understand the overall interaction between individuals, technology, ethics and society

B. Development based knowledge of theory, methods and practice used to influence design and development of products able to enrich and improve the daily life of others

C. Development based knowledge of theory, methods and practice used to be able to design products or services which consider interhuman collaboration

D. The ability to understand and reflect on the practice, applied theories and methods and reflect on the practice and application of theories and methods in the context of developing and designing interactive and user oriented products and concepts

Skills:

A. The ability to become capable of choosing and integrating concepts and technology from different fields throughout the design process; including manufacture of a prototype

B. The ability to design products and services which are both innovative and market-oriented

C. The ability to maintain a clear and varied view on a design project, incorporating both personal and interhuman aspects

D. The ability of mastery the design process and to work out of a holistic approach with emphasis on the human being throughout the design process towards an innovative, user oriented product

E. The ability to design quality of life for the user through knowledge of the human physiology, senses and interaction with technical products. This knowledge is to be applied in user surveys to understand the users' needs, and to interpret their feedback

F. The ability to design mechanical remedies and to link that with the human ergonomic capacity. Hereby the understanding from idea to user survey, sketching, choice of material, design and finally manufacture of a prototype

G. The ability to develop intelligent electronic products and to design products linked to human senses. In intelligent products, the user's interaction with the product's user interface (software) is emphasised in particular

H. The ability to integrate social -and market conditions in the design process. Hereby the understanding of the company's organisation and management together with business principles, market awareness and strategic marketing

Competencies:

A. The ability to independently participate in the development of user-centred design products with focus on the user´s needs and interaction with technological products

B. The ability to improve one´s academic skills, personal development and design interpretation based on an on-going process of self-reflection and interest in the technology development of tomorrow

C. The ability to work as a professional engineer and continue studying on a relevant Master of Science programme at SDU or other universities

Qualifications Matrix

BACHERLOR OF ENGINEERING – IN MECHATRONICS	IDUCP (1. sem)	MCD (2. sem)	MECHEL (2. sem)	ECD (3. sem)	EMB (3. sem)	SENS (3. sem)	CSB (4. sem)	EMB (4. sem)	MC-EXS (5. sem)	FOS (5. sem)	IET (6. sem)	PROJ (7. sem)
KNOWLEDGE												
A	X	X		X			X		X		X	X
B		X		X			X		X		X	X
C	X			X		X			X		X	X
D	X	X	X	X	X	X	X	X	X	X	X	X
SKILLS												
A	X		X			X			X		X	X
B							X		X		X	X
C		X		X					X		X	X
D		X		X			X		X		X	X
E		X		X		X			X		X	X
F	X		X						X		X	X
G	X			X	X	X	X	X	X		X	X
H									X		X	X
COMPETENCIES												
A	X	X	X	X	X	X	X	X	X		X	X
B				X			X		X	X	X	X
C			X		X	X		X	X		X	X

§3 Subject Columns and Progression of the Study Programme

The competencies of the Interaction Design engineer are built up around students working with topics from five subject columns:

- The Human being and the Design process
- Technology - Fundamentals of engineering
- Technology - Mechanical product and design development
- Methods and personal learning
- Specialisation

The academic topics are interlinked during the individual semesters by semester themes. Throughout the course study, students continually acquire the necessary academic knowledge, while at the same time gaining personal competencies. The columns include the following subjects and disciplines.

The Human being and the Design process

Consists principally of the academic fields: Design Anthropology (DA), Ergonomics (ERG), Human Perception (HUP), Human Computer Interaction (HCI) and Form and Semantics (FOS5ID) with the following principal content:

DA: basic principles of ethnography and design anthropology, field studies and informants, role of the ethnographer: ethics and empathy, critical overview of of existing ethnographic and participant observation methods being used, data processing: categories and theory, explore different forms of media to communicate field and studio findings : user portraits, personae and working scenarios.

ERG: Body perspectives – then & now; Shapes and Elements of the Body; anatomy and providing systems (joints and muscles); Body & Movement: motor apparatus, simple movement analysis; Body balances, Possibilities and Limitations of the body; Body Skills; Body and Context; Body at Work; The Future Body.

HUP: View, visual signs, analogue displays and indicators, sterero vision; hearing, audio signals; sense of touch, surface quality; sense of smell- and taste; perception of time and space; the nervous system and the brain analysis of sensory perception, fundamental signal processing.

HCI: Human cognition and memory, stimulus and response; information, knowledge and communication; mental models of designers and users; affordance, feedback and feed-forward; user interfaces and screen interaction; language and voice recognition; the concept of artefact; human interaction in social and historic context.

FOS5ID: Form and communication; syntax-characteristics of the mode of expression; semantics – form and expression; pragmatics – function, usage; form and identity of the product; perception, aesthetics and usage; colors, materials, surface.

Progression through this column enhances the student´s ability to explain the interaction between human senses and electronic systems and sensors. Also knowledge and understanding of how people perceive, think and react on signals from the outside world, when being alone and in social contexts.

Technology - Fundamentals of engineering

Consists principally of the academic fields: Dynamic systems (DYM), Materials and Processes (MAP) and Electricodynamic (EDY) with the following principal content:

DYM: Integrating techniques; Differentiation techniques; Vectoral algebra; atrices; Absolute speed and acceleration; Coordinate systems; Newtons laws; Work and Energy; Momentum, angular momentum and conservation theorems.

MAP: Concepts and data for the mechanical, electrical, magnetic, thermal, physical and durability properties of materials; The coherence between the structures and properties of metals and polymers; Methods to improve the basic properties of materials, including their strength; Different methods for material testing; Modelling processes for metals and polymers; Application of programs and databases for the systematic selection of materials and processes; Work on tolerance indication and tolerance evaluation.

EDY: Trigonometrical functions; Complex numbers; Differentiation/integration technique; Taylor series and L´Hôpital´s rule; Electrical fields; Magnetic fields; Simple motors.

Progression through this column enhances the student´s ability to develop mechanical components and mechatronic products and systems, based on mechanics, electronics and embedded technologies.

Technology - Mechanical product and design development

Consists principally of the academic fields: Mechanical Design (DES), Mechanics 1 (MECH1), Sensors and Actuators (SAA), Electronics (ELEC), Embedded Systems 1 (EMB3) and Embedded Systems 2 (EMB4), Advanced Programming (ADP)

DES: Modelling with primitive solid elements; Modelling with parametric solid elements; Modelling with curves and sketches; 3D assembly modelling with solid components; Design of technical drawings with section views and dimensions including tolerances; Making technical drawings on the basis of 3D assembly model; Making an exploded view on the basis of a 3D assembly model; Making a parts list on the basis of a 3D assembly model.

MECH1: Forces and couples; Isolation of mechanical systems made up of one or more solids; Dry friction; Torsion of circular members; Internal effects; Design of beams for bending; Kinematics and kinetics of rigid bodies; general equations of motion translation, fixed-axis rotation, work, energy and power, impulse, momentum.

SAA: Sensor characterisation; Accuracy and error estimation; Basic understanding of semiconductor materials; Electromechanical, thermal, radiation and electromagnetics transducers; Simple actuators.

ELEC: A/D and D/A converters; Operational amplifiers; Feedback; Diodes; Bipolar junction transistors; FET transistors; Transistor used as switch; Computer simulations; Methods for EMC correct circuits.

EMB3: Numbering systems; Programming in C, including: simple data types, control structures, functions, arrays, structs, pointers, bitwise operators, microcontroller systems.

EMB4: Logic components, Boolean algebra; Latches and flip-flops; State machines; Microcontroller hardware; Peripheral units; Interrupts.

ADP: Basic and advanced GUI elements; Advanced C++ and .NET; Graphical user-interfaces using the .NET framework.

Progression through this column enhances the student´s ability to use advanced theoretical methods in the process of analysing, modelling and developing dynamic mechatronic systems.

Methods and personal learning

Consists principally of the academic fields: Semester Project 1 (SPRO1ID), Semester Project 2 (SPRO2ID), Semester Project 3 (SPRO3ID), Semester Project 4 (SPRO4ID), Experts in Teams (MC-EXS5) and IDINGPR (Industrial Engineering Training – Internship) with the following principal content:

SPRO1ID: The User-Centred Design Process. The project is divided into 5 sub-projects. Each sub-project will be introduced by a lecture about the topic, and at the end of each phase there will be a hand-in. Students will work in groups of 3-4 persons. The main topics are: Humans, Interaction, Technology and Business Understanding, The Design Process and Concept Development.

SPRO2ID: Mechanical Concept Design. The students work together in groups. By following the steps of methodised design the students will develop a mechatronic product or device that addresses the needs of a focus group. The main topics are problem statement, project planning, idea development, prototype design, report writing and documentation. Project examples: lifting mechanism for the healthcare, hospital bed with various features, manually operated press etc.

SPRO3ID: Electronic Concept Design. The students work together in groups. The technical part of the project will focus on development of an electronic product or the production process of an electronic product. The main topics are: exercises in application of sensor techniques, project formulation and planning, user surveys, idea development, design of an operational laboratory model, documentation and presentation.

SPRO4ID: Concept Design of Product with Software-Based User Interfaces. The students will work in groups and be responsible of designing and specifying the entire production facility of a chosen or given product. The main topics are: user involvement during the requirement stage, human interface design, software development and design of a functional model.

MC-EXS5: Experts in Teams. The students will be challenged by a complex product development situation. They will work together in large teams in a project with many stakeholders where the ability to cooperate with different people (engineers and non-engineers) and the ability to organise the project as well as the ability to use one´s own expertise is a “must” to achieve a satisfying result. Theory of Science will be completed.

MC-IET: Industrial Engineering Training – Internship. The student gains practical and theoretical experience as an employee in a company – working as an engineer.

Progression: through the project enhance and develop personal and learning competencies while at the same time the academic competencies in the areas of Commitment, Initiative, Responsibility, Ethics, Establishment, Ability to put personal learning into perspective and learning competencies in the area of: Analysis and assessment of data material; Communication of working results using approaches that require reflection, cooperation and independency. The progression finalises with the one semester internship – where the student will be challenged on all competencies and experience how it is to be an engineer in reality.

Specialisation and electives

Focusing on competencies is done by choosing elective courses in the fourth and fifth semesters (15 ECTS points in total). The course will be in the domain of the MCI research, e.g.: Developing Engineering Applications for Mobil Platforms, User Centered Design, Co-Design, Cleanroom Microfabrication, Programming Logic Design, Real Time Operating System

§4 Semester Themes

Semester	SEMESTER THEMES
7.	**Final Project**
6.	**Engineering Internship**
5.	**Product Concepts – Experts in Teams**
4.	**Intelligent Interaction – Bytes and Brains**
3.	**Electronic Interaction and Sensors– Sensors and Senses**
2.	**Mechanical Interaction and Actuators – Muscles and Motors**
1.	**Discovery: User-Centred Design Process**

§5 Semester Modules

<table>
<tr><td>Semester</td><td colspan="30">STRUCTURE</td></tr>
<tr><td>7.</td><td colspan="30">MC-PROJ
Final Project</td></tr>
<tr><td>6.</td><td colspan="30">MC-IET
Industrial Engineering Training - Internship</td></tr>
<tr><td>5.</td><td colspan="10">MC-EXS5
Experts in teams</td><td colspan="8">FOS5ID
Form and Semantics (FOS1)</td><td colspan="6">Elective</td><td colspan="6">Elective</td></tr>
<tr><td>4.</td><td colspan="18">CSB4ID
Concept Design of Product with Software-Based User Interfaces (SPRO4ID, HCI, ADP)</td><td colspan="6">EMB4
Embedded Systems 4 (EMB2)</td><td colspan="6">Elective</td></tr>
<tr><td>3.</td><td colspan="12">ECD3ID
Electronic Concept Design (SPRO3ID, HUP)</td><td colspan="6">EMB3
Embedded Systems 3 (EMB1)</td><td colspan="12">SENS3
Sensors and Electronics (SAA, ELEC)</td></tr>
<tr><td>2.</td><td colspan="18">MCD2ID
Mechanical Concept Design (SPRO2ID, DA, ERG)</td><td colspan="12">MCMECHEL
Mechanics and Electrodynamics (MECH1, EDY)</td></tr>
<tr><td>1.</td><td colspan="30">IDUCP1
User-Centred Design Process (SPRO1ID, DES, MAP, DYM)</td></tr>
<tr><td>ECTS POINTS</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr>
</table>

Workshop training is also included during the first year. The workshop training is mandatory and assessed on a pass / fail basis.

§6 Description of First Semester

SEMESTER THEME:

”Discovery: User-Centred Design Process”

VALUE ARGUMENT:

Through technical elements and a number of projects, students are provided with basic tools for the rest of the programme and an overview of the entire interaction design field.

It is important for new students to quickly get an insight into the professional competency of the programme, as well as the working methods of the user-centred design process.

In 5 sub-projects we work on design tasks providing an overview and comprehension of the correlation between user surveys, interaction analysis, understanding technology and management and the design process in concept developments.

COMPETENCY GOALS:

Students will be able to:

- understand the overall correlations in a design process of concept developments
- carry out ethnographical user surveys
- analyse human interaction with technological products
- comprehend the function of products, and evaluate technological possibilities
- carry out a business analysis and understand business concepts
- choose methods and tools in a design process
- carry out a concept development along with designing a part for a mechanical product
- choose materials and processes, as well as make mechanical calculations of a sub-product
- contribute in the teamwork and, evaluate and develop their own learning process

SEMESTER STRUCTURE:

IDUCP1 – User-Centred Design Process (30 ECTS)

The module is compulsory and part of the first-year exam.

CONTEXT:

The semester includes one module: IDUCP1 provides an understanding of the working methods in a user-centred design process with focus on the users’ needs and interaction with technological products. The module contains a semester project (SPRO1ID – 15 ECTS) of the same title as the semester theme. Through three supporting academic fields: DES: Mechanical Design – 5 ECTS, MAP: Materials and Processes – 5 ECTS and DYM: Mathematics/Physics ((dynamic systems) - 5 ECTS), we work on design tasks incorporating user surveys, interaction analysis, comprehension of technology and management, design, choice of materials and processes, as well as mechanical calculations. The work is completed with a concept development including all sub-elements of the semester.

The module and academic fields on the first semester are organised in a way so they will adapt to the level of incoming students according to the entry requirements for the programme.

The semester project (SPRO1ID) introduces the process of developning technology in team work based on the students' entry level and on the supporting academic fileds on the semester.

The academic fields DES and MAP introduce methods and technolologies to support the semester project and the academic field DYM introduces engineering mathematics and physics based on the entry level, developing into the engineering level and approach.

§7 Description of Second Semester

SEMESTER THEME:

"Mechanical Interaction and Actuators – Muscles and Motors"

VALUE ARGUMENT:

Emphasis is put on design of mechanical remedies able to be linked to the human ergonomic capacity. We work on user interaction with mechanical systems.

It is important to design mechanical systems in balance with the physical performance of individuals and the user's interaction with the product. Thus, teaching in ethnographic user testing and ergonomics is integrated with a project in concept development of a dynamic mechanical system supporting/training a body movement.

COMPTENCE GOALS:

Students will be able to:

- understand the links between the physical/ergonomic performance of the human being and mechanical systems
- carry out ethnographical user surveys and hereby analyse the user's needs and interaction with mechanical products
- analyse ergonomic issues, and design mechanical suggested solutions
- develop and design a concept solution for a user-friendly, dynamic, mechanical system
- design, calculate, and provide documentation of a dynamic, mechanical system
- present test models and prototypes for user testing
- solve electromagnetic problems

SEMESTER STRUCTURE:

MCD2ID – Mechanical Concept Design (20 ECTS)
MC-MECHEL –Mechanics and Electrodynamics (10 ECTS)

Both modules are compulsory. Together with first semester, MCD2ID constitutes the first-year exam

CONTEXT:

The semester includes two modules: MCD2ID (Mechanical Concept Design) and MECHEL (Mechanics and Electrodynamics). MCD2ID focuses on the theme of the semester, with a semester project (SPRO2M – 10 ECTS) supported by two academic fields (DA – 5 ECTS and ERG – 5 ECTS) The two academic fields provides an understanding of the coherence between the physical/ergonomic performances of the human being; the user's needs, and design of mechanical systems. Through project work, we work on design and concept development of a user-friendly, dynamic, mechanical system supporting/training a body movement.

The module MECHEL (Mechanics and Electrodynamics)) provides the background for the design of mechanical systems, particularly the theoretical angle in terms of the associated mechanics, mathematics and physics. This includes the academic fields MECH1 – 5 ECTS and EDY – 5 ECTS.

§8 Description of Third Semester

SEMESTER THEME:

”Electronic Interaction and Sensors – Sensors and Senses”

VALUE ARGUMENT:

Emphasis is put on the comprehension of design of electronic systems able to be linked to human perception. We work on concept development of electronic systems and sensors able to support, replace and affect human perception.

It is very important to understand and find the potentials of the interaction between human perception and electronic systems/sensors. Thus, teaching in electronic systems and sensor techniques is integrated with courses in human perception.

COMPETENCE GOALS:

Students will be able to:

- understand analogies and the interaction between human perception and electronic systems/sensors
- analyse and dimension electronic systems and sensors/actuators
- complete a design project from user survey to evaluation of prototype
- develop and design a concept solution for an electronic system/sensor, able to measure a condition that involves human perception
- design and evaluate a working laboratory model

SEMESTER STRUCTURE:

ECD3ID – Electronic Concept Design (15 ECTS)
SENS3 – Sensors and Electronics (10 ECTS)
EMB3 – Embedded Systems 3 (5 ECTS)

All three modules are compulsory.

CONTEXT:

The semester consists of three modules ECD3ID – Electronic Concept Design, SENS3 – Sensors and Electronics and EMB3 – Embedded Systems 3. In ECD3ID students complete a semester project (SPRO3M – 10 ECTS) supported with the academic field Human Perception (HUP – 5 ECTS). Through the projectstudents work on design and concept development of an electronic system/sensor able to measure a condition that involves human perception. It provides an understanding of the connection between human perception and needs, and design of electronic systems. The module EMB3 – 5 ECTSprovides the students with knowledge and skills to develop smaller embedded programs in a high-level language. The module SENS3 (10 ECTS) comprises electronics, sensors and actuators and deals in particular with the development of electronics as well as sensors and actuators in the academic fields ELEC1 – 5 ECTS and SAA – 5 ECTS.

§9 Description of Fourth Semester

SEMESTER THEME:

”Intelligent Interaction – Bytes and Brains”

VALUE ARGUMENT:

Emphasis is put on the comprehension of design of intelligent products with software-based user interface. We work on the user’s complex interaction with these intelligent products.

It is important to achieve the ability to analyse and understand the user’s complex interaction with intelligent products. Having this knowledge, you can see the potentials, and design a user-friendly interaction and operation of these products.

Thus, teaching in microcontroller and embedded systems is integrated with ”Human Computer Interaction” which builds on insight in human psychology.

COMPETENCE GOALS:

In the fourth semester students attain the following academic competencies:

- comprehend human perception, mindset and response to signals from the outside world; when alone or in social contexts.
- analyse and explain the interaction between people and digital products
- analyse and design hardware and software for electronic products
- complete a design project from user survey to evaluation of prototype
- develop and design a concept solution for an electronic product with a software-based user interface
- design and evaluate a function model

SEMESTER STRUCTURE:

CSB4ID – Concept Design of Product with Software-Based User Interfaces (20 ECTS)
EMB4 – Embedded Systems 4 (5 ECTS)
Elective courses equivalent to 5 ECTS

Module CSB4ID and EMB4 are compulsory.

CONTEXT:

The semester consists of two modules CSB4ID – (Concept Design of Product with Software-Based User Interfaces) and EMB4 (Embedded Systems 4). In addition, students must choose an elective course.

CSB4ID consists of a semester project (SPRO4ID – 10 ECTS) and is supported by the academic field HCI (Human Computer Interaction – 5 ECTS) and ADP (Advanced Programmering – 5 ECTS). Through project work, students work on concept development and design of a software-based human machine interface. It provides an understanding of the user’s complex interaction with intelligent products.

The module EMB4 provides the students with the ability to analyse and design digital systems, as well as to understand the user’s interaction with these.

§10 Description of Fifth Semester

SEMESTER THEME:

”Product Concepts – Experts in Teams”

VALUE ARGUMENT:

Emphasis is put on achieving a holistic understanding of product concepts seen from both the user’s, the manufacturer’s and the investor’s point of view. We work on realisable product concepts from an external proposer.

It is important to find the balance between the different requirements of the design process: Interaction, form, surface characteristics, materials, technological potentials, production technology and marketing. Thus, teaching in form, color and manufacture is integrated with ”Co-design” – players of the design process. Furthermore, students must acquire experience in completion of project work in an innovative and entrepreneurial context. The project work is organised in a virtual company, and students must go through all the developments steps – from idea to manufacture of a fully working prototype; considering finances, external suppliers etc.

COMPETENCE GOALS:

In the fifth semester students attain the following academic competencies:

- analyse, understand and communicate the interaction, form, expression, communication potentials and values of an interactive product
- design product concepts and relate alternative solutions to the requirements of technology, manufacture and marketing
- comprehend fundamental principles of teamwork and collaborative design processes
- plan and facilitate activities that encourage collaborative design and iterative courses of development
- plan and organise, manage and complete a cross-functional project in co-operation with engineering students from other programmes, and external players
- establish professional, external relationships, and plan their own career opportunities
- apply research methods when solving new problems
- understand the philosophic aspects of natural science, taking as their starting point specific scientific methodical activities in the projects

SEMESTER STRUCTURE:

MC-EXS – Experts in Teams (15 ECTS)
FOS5ID – Form and Semantics (5 ECTS)
Elective courses equivalent to 10 ECTS

Modules MC-EXS and FOS5ID are compulsory.

CONTEXT:

The semester consists of two modules, where MC-EXS is a project with the participation of external stakeholders and a larger group of students coming from the three engineering programmes – Mechatronics, Innovation and Business and Interaction Design. The project consists of a “real world”

challenge, and can only be solved with the impact of the different group members cooperating and organising in professional manner. Engineering methodology forms an integral part of the project work, and particular emphasis is placed on project management, organisation and roles on the project. There is focus on the application of the methods of research and science theory. The module includes the academic field: Science theory.

The module FOS5ID covers form and semantics. Emphasis is put on the ability to assess interactive product's interaction, form, expression and communication possibilities.

EXCHANGE POSSIBILITIES

The faculty recommends and supports, that students go for one semester exchange at another university. On the Interaction design bachelor programme the 5th semester can be used for this purpose. The Experts in Teams module (MC-EXS – 15 ECTS) and the elective courses (10 ECTS) can be exchanged to elective courses at our partner universities – preferable including some project work. The remaining course (FOS5ID) can be exchanged with a relevant course with a majority of the same topics. The exchange programme must be approved by the faculty study board.

§11 Description of the Sixth Semester

SEMESTER THEME:

”Engineering Internship”

VALUE ARGUMENT:

In this semester the focus is on practical training of core competencies of the programme and gives an understanding of how engineering is in the “real world” perspective, how companies are organised and the role of different employees. The students´knowledge skills and competencies are improved by taking part in the company´s projects; and thus train the acquired theory and project procedures.

COMPETENCE GOALS:

To expand on the students’ business understanding, develop their creativity, independence and interpersonal skills; and to provide students with more of the following competencies:

- Ability to transform the theoretical core areas of the programme into practical and feasible projects
- Competency requiring that new knowledge is acquired to carry through projects
- Comprehension of a company’s organisational, economic, social and work-related conditions
- Knowledge of a company’s social and executive environment (communication and co-operation among employees at different level; as well as rules and clerical routines)
- Skills in presenting working results both orally and in writing; in forums of different level

SEMESTER STRUCTURE

MC-IET – Industrial Engineering Training (30 ECTS)

The module is compulsory.

§12 Description of the Seventh Semester

SEMESTER THEME:

”Final Project”

VALUE ARGUMENT:

Focus is put on problem-based project work linked up to the principal subjects of the programme.

The final project must reveal an independent, experimental or theoretical discussion of a practical problem linked up to the principal subjects of the programme. The student is trained in professional problem-solving in co-operation with an internal supervisor and an external supervisor from industry.

COMPETENCE GOALS:

The final project must demonstrate the student’s ability to independently describe, analyse and build up solutions for practical engineering problems. The student must prove skills in:

- translating technical research results; and scientific and technical knowledge into practical application by means of development tasks and solving technical problems
- having a critical and reflective approach to experiences from the internship
- critically acquiring new knowledge within relevant engineering areas and hereby independently solve engineering problems
- drawing in social, economic, environmental- and working consequences when solving technical problems
- attending executive- and co-operative relations with people of different educational and cultural background
- putting into perspective the project’s results to a broader target group.

SEMESTER STRUCTURE

MC-PROJ – Final Project (30 ECTS)

The module is compulsory

§13 Entry into force and changes

1. Approved by the Academic Study Board of the Faculty of Engineering on 16 June 2010. Approved by the Director of Studies on behalf of the Dean of the Faculty of Engineering on 7 July 2010.

2. Curriculum 2012 approved by the Academic Study Board of the Faculty of Engineering and by Director of Studies on behalf of the Dean of the Faculty of Engineering on 7 March 2012 (Version 1.0).

3. Amendments approved by the Academic Study Board of the Faculty of Engineering and by Director of Studies on behalf of the Dean of the Faculty of Engineering on 14 November 2012 (Version 1.1)

4. Amendments approved by the Academic Study Board of the Faculty of Engineering and by Director of Studies on behalf of the Dean of the Faculty of Engineering on 18 April 2013 (Version 1.2)

5. Curriculum 2014 approved by the Academic Study Board of the Faculty of Engineering and by Director of Studies on behalf of the Dean of the Faculty of Engineering on 10 October 2014 (Version 1.0)

6. Amendments approved by the Academic Study Board of the Faculty of Engineering and by Director of Studies on behalf of the Dean of the Faculty of Engineering on 18 March 2015 (Version 1.0)