UNIVERSITY OF SOUTHERN DENMARK

Chapter 9
Programme specific part of the curriculum for

Bachelor (BSc) i teknisk videnskab (mekatronik)

Bachelor of Science (BSc) in Engineering (Mechatronics)

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

The mechatronics study programme provides a broad foundation of knowledge in the fields of mechanics, electronics and software. In addition, students also have the opportunity to specialize through the choice of elective courses from the MCI research groups in Nanotechnology, Embedded Systems or Dynamic Mechatronic Systems. The study programme focuses on product development. This primarily provides employment opportunities with companies that develop and sell mechatronic products. The broad general knowledge and particular specialized areas enables the mechatronics engineer to practice a variety of functions in the company. Typical job profiles are as follows:

- Development Engineering
- Project Management
- Customer Adviser
- Project Sales
- Training

Typically, mechatronics engineers will begin their careers as development engineers. Within a few years, they will have the opportunity to combine technical work with management functions. Engineers are often involved in cross-organizational development processes, as well as being involved in partnerships with external companies, both nationally and internationally. Alternatively, they may develop into specialists in particular technologies, or perhaps start their own business.

The bachelor programme in mechatronics provides an immediate opportunity to continue with an MSc (Eng) in mechatronics or a corresponding continuation study programme at the University of Southern Denmark (SDU) or another university.

§2 Competency Description of the Study Programme

Knowledge:

A. Research based knowledge of theory, methods and practice used to develop mechanical components and systems for mechatronic products.

B. Research based knowledge of theory, methods and practice used to develop analog and power electronic circuits used in mechatronic products.

C. Research based knowledge of theory, methods and practice used to develop embedded solutions used in mechatronic products.

D. The ability to understand and reflect on theories, scientific methods and practice in the interplay between technologies, in the context of developing mechatronic systems and products.

Skills:

A. The ability to apply the scientific and engineering methods and use state-of-the-art tools in the process of developing mechatronic systems and products.

B. The ability to analyze, specify and develop mechanical components and systems in a mechatronic context.

C. The ability to analyze, specify and develop analog- and power- electronic circuits in a mechatronic context.

D. The ability to analyze, specify and develop embedded hardware and software in a mechatronic context.

E. The ability to evaluate theoretical and practical issues in the mechatronic development process, as well as to explain and choose the optimum solution methods and –technologies suited to solve a given mechatronic development task.

F. The ability to document, present and communicate engineering issues and solution models to both peers and non- specialists.

Competencies:

A. The ability to handle complex and development- oriented situations in study or work contexts as an expert in an international engineering context.

B. The ability to independently participate in product development projects and interdisciplinary collaboration with a professional engineering approach.

C. The ability to independently take responsibility and identify one's own learning needs and organize one's own learning in different learning environments.

D. The ability to continue studying on a relevant Master of Science programme at SDU or other universities.

Qualification Matrix

BACHELOR OF SCIENCE IN ENGINEERING - MECHATRONICS	MC-MDP (1. sem)	MC-BMM (2. sem)	MCMECHEL (2. sem)	MC-DIM (3. sem)	MC-DYN (3. sem)	MC-COM (4. sem)	MC-CAE (4. sem)	MC-THER (4. sem)	MC-EXS (5. sem)	MC-COE 1 (5. sem)	MC-COE 2 (6. sem)	MC-AEM (6. sem)	MC-BPRO (6. sem)
KNOWLEDGE:													
A	X		X		X		X	X	X				X
B		X		X		X		X	X	X	X	X	X
C	X	X							X				X
D	X	X	X	X	X	X	X	X	X	X	X	X	X
SKILLS:													
A		X		X		X	X	X	X	X	X	X	X
B	X	X	X		X		X		X				X
C		X		X		X			X	X	X	X	X
D	X	X							X				X
E		X	X	X	X	X	X	X	X	X	X	X	X
F	X	X		X		X			X				X
COMPETENCIES:													
A	X			X		X			X				X
B		X				X			X				X
C									X				X
D			X	X	X		X	X	X	X	X	X	X

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§3 Subject Columns and Progression of the Study Programme

The competencies of the mechatronics engineer are built around students working on topics from five subject columns:

- The theoretical foundation in mathematical/physical modelling;

- Dynamic conditions in mechatronic products – practical and theoretical;

- Technologies, design and development;

- Methods and personal learning; and

- Specialization.

The academic topics are interlinked during the individual semesters by semester themes. Throughout the course of 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 theoretical foundation in mathematical/physical modelling

Consists principally of the academic fields: DYM, ESY, EPHYS, MC-THER, MC-CAE, with the following principal content:

DYM: Integration techniques; Differentiation techniques; Vectoral algebra; Matrices; Absolute speed and acceleration; Coordinate systems; Newton's laws; Work and energy; Momentum, angular momentum and their preservation.

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

EPHYS: Laplace transformation; Fourier transformation; Z transformation.

MC-THER: Principal theories of thermodynamics; Equation of energy; Equation of state; Momentum theorem; Equation of continuity; Open and closed systems; Circulatory processes; Flows in compressible and incompressible media; Momentum and forces caused by flows; Heat transmission.

MC-CAE: Analysis of linear, static and heat transfer problems in axial, plane and three dimensional models. Finite element analysis using the ANSYS simulation tool.

Progression through this column enhances the student's ability to understand the underlying physical circumstances and to use the relevant mathematical models in an engineering context.

Dynamic conditions in mechatronic products – practical and theoretical

Consists principally of the academic fields: MC-COE1, MC-COE2, MECH1, MECH2, MC-AEM with the following principal content:

MC-COE1: Modelling of dynamic systems; Model of DC motor; Transient analysis and frequency analysis; Stability of closed loop systems; Dimensioning of lead-lag and PID compensation; Computer simulations with MATLAB.

MC-COE2: State equations in analogue and digital form; State-space controller; Controllability and observability; Controller for reference input; Integral controller.

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.

MECH2: Load diagrams; Tension; Bending; Torsion; 3D loads; Singularity functions; Combined stress; Mohr's circle; Static and dynamic load; Endurance limits; Wöhler and Goodman diagrams; Machine parts: shafts, bearings, springs.

MC-AEM: Electromagnetics focusing on the solution of various electrical engineering and physical problems.

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

Technologies, design and development

Consists principally of the academic fields: DES, MAP, EMB1, EMB2, SAA, ELEC1, ELEC2, PWE with the following principal content:

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 a 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.

MAP: Concepts and data for the mechanical, electrical, magnetic, thermal, physical and durability properties of materials; The coherence between the structures and the properties of metals and polymers; Methods to improve the basic properties of materials, including their strength; Different methods for materials 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.

EMB1: Numbering systems; Programming in C, including: simple data types, control structures, functions, arrays, structs, pointers, bitwise operators, microcontroller systems.

EMB2: Logic components; Boolean algebra; Latches and flip-flops; State machines; Microcontroller hardware; Peripheral units; Interrupts.

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

ELEC1: Passive circuits for DC operation, transient analysis, frequency analysis, simple active circuits, Transistors, Amplifiers.

ELEC2: Operational amplifiers, Feedback, Filters – active and passive, A/D and D/A conversion.

PWE: Development of power electronics to drive actuators, motors, etc.

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

Methods and personal learning

Consists principally of the academic fields: SPRO1M, SPRO2M, SPRO3M, SPRO4M, MC-EXS, with the following themes and principal content:

SPRO1M: The Mechatronic Development Process. An introduction to the Mechatronics disciplines: concept, interdisciplinarity and particular focus on the development process. A mechatronic product is designed by applying the other skills acquired during the semester.

SPRO2M: Build Mechatronics. A mechatronic product is built that is capable of autonomous movement. The other subjects of the semester are the academic basis for the project.

SPRO3M: Develop Mechatronics. The focus is on the development of an intelligent, dynamic mechatronic product. Theory of Science is introduced.

SPRO4M: Construct Mechatronics. The project for the semester is based on the development of Power Electronics as part of a mechatronics system.). Theory of Science continues from SPRO3M.

MC-EXS: 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 organize 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.

Progression through the projects enhance and develop personal and learning competencies, while at the same time the academic competencies are learned in depth and brought to maturity in "real" projects, thus giving personal 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.

Specialization and electives

Focusing of competencies may be done by choosing electives in the fourth, fifth and sixth semesters (20 ECTS points in total). The courses will be in the domain of the MCI research, -e.g.: Micro- and Nanotechnology, Embedded Control Systems or Modelling and Control of Mechatronic Systems.

§4 Semester themes

Semester	SEMESTER THEMES
6.	**Bachelor Project**
5.	**Experts in Teams**
4.	**Construct Mechatronics**
3.	**Develop Mechatronics**
2.	**Build Mechatronics**
1.	**Discover Mechatronics**

§5 Semester modules

Semester	STRUCTURE			
6.	**MC-BPRO** Bachelor Project	**MC-COE 2** Control Engineering	**MC-AEM** Applied Electromagnetics	**Elective**
5.	**MC-EXS** Experts in Teams	**MC-COE 1** Control Engineering	**Elective**	**Elective**
4.	**MC-COM** Construct Mechatronics (SPRO4M, PWE)	**MC-CAE** Computer Aided Engineering	**MC-THER** Thermodynamics	**Elective**
3.	**MC-DIM** Develop Intelligent Dynamic Mechatronic Systems (SPRO3M, SAA, ELEC2)		**MC-DYN** Dynamic Systems (MECH2, EPHYS)	
2.	**MC-BMM** Build Mechatronic Products that can Move (SPRO2M, ELEC1, EMB2)		**MCMECHEL** Mechanics and Electrodynamics (MECH1, ESY)	
1.	**MC-MDP** The Mechatronic Development Process (SPRO1M, MAP, DES, EMB1, DYM)			
ECTS points	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30			

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

The theme for the first semester is 'The Mechatronic Development Process'.

VALUE ARGUMENTATION

It is important for new students to gain an insight into what mechatronics is, as well as an understanding of how the development of mechatronic products may proceed, as this will later enable them to understand and make use of the more complex concepts and skills required for the development of mechatronic products.

During the project work this semester, students will experiment with the design of a small mechatronic product and will be guided through all the phases of the development process. This will enable students to gain a general knowledge of the individual disciplines, the interdisciplinary nature of the work, and the process involved, thus providing them with an overview of what mechatronics is. The project is supported by the semester courses in mechanical design, materials and processes, and embedded systems, as well as the associated physics/mathematics.

COMPETENCE GOALS

Students will be able to:

- explain and use a structured, phased product development module for the development of a mechatronic product from idea, concept, outline, choice of materials/process through to prototype manufacture;

- design, and have manufactured, mechanical elements based in CAD;

- write software that is able to register input from the surroundings, process this and send control information back to the environment using an existing hardware platform; and

- understand the mathematical and physical basis of simple mechanical systems.

SEMESTER STRUCTURE

MC-MDP – The Mechatronic Development Process (30 ECTS)

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

CONTEXT

The semester includes one module: MC-MDP (The Mechatronic Development Process). The module contains a semester project (SPRO1M – 10 ECTS) of the same title as the semester theme, as well as four supporting academic fields. Overall, this forms an introduction to the concept of mechatronics and its associated core skills. The four academic fields are: DES – 5 ECTS: Mechanical Design; MAP1- 5 ECTS: Materials and Processes; EMB1 – 5 ECTS: Embedded Hardware/Software; and DYM – 5 ECTS: Mathematics/Physics (dynamic systems).

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

Approved on 10 April 2014 by the Academic Study Board of the Faculty of Engineering

The semester project (SPRO1M) introduces the field of mechatronics and the process of developing technology in team work based on the students entry level and on the supporting academic fields on the semester.

The academic fields DES, EMB1 and MAP introduces methods and technologies 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

The theme for the second semester is 'Build Mechatronics'.

VALUE ARGUMENTATION

In relation to the development of mechatronic products, it is important for students to have both knowledge and understanding of the system in general and knowledge of the system components and their interaction.

This semester introduces "thinking about the system" and builds up experience in the modelling of systems with feedback. In addition, students learn how to design electronic and mechanical elements, as well as how to manufacture and apply them in a mechatronics context. This approach takes the form of a semester project in which the theme of the semester is central: the construction of a mechatronic product that can move. The project is backed up by the other academic fields of the semester, which provide an insight into the technology and the physical/mathematical foundation.

COMPETENCE GOALS

Students will be able to:

- design and have mechanical components manufactured;

- build digital electronics;

- integrate electronics, mechanics and software into an overall functioning system; and

- describe the kinematics of a system and produce simple mathematical models of systems with feedback.

SEMESTER STRUCTURE

MC-BMM – Build Mechatronic Products that can Move (20 ECTS)
MCMECHEL – Mechanics and Electrodynamics (10 ECTS)

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

CONTEXT

The semester includes two modules: MC-BMM (Build Mechatronic Products that can Move) and MCMECHEL (Mechanics and Electrodynamics). MC-BMM focuses particularly on the theme of the semester, thus in the semester project (SPRO2M – 10 ECTS) a mechatronic system that can move, is to be built. The two associated academic fields, ELEC1 – 5 ECTS and EMB2 – 5 ECTS, provide an insight into the development of analog electronics and the design of digital electronics.

Including the competencies attained in the first semester, students will thus be able to build a complete system.

The module MCMECHEL (Mechanics and Electrodynamics) provides the background to the semester, particularly the theoretical angle in terms of the associated mechanics, mathematics and physics. This includes the academic fields MECH1 – 5 ECTS and ESY – 5 ECTS.

§8 Description of third semester

SEMESTER THEME

Develop Mechatronics

VALUE ARGUMENTATION

From the first two semesters, students have attained a fundamental knowledge of mechatronics and the mechatronics development process. Furthermore they have learned how to design basic mechanics and electronics. In this semester, it is important for students to attain a more professional approach to the development of mechatronic products. This is achieved by teaching students in the subjects of analog electronics, actuators and sensors, and dynamic systems. A project is completed in which students' development efforts are focused on the application of actuators and sensors, the design of electronics and the specification and production of mechanics, thus enabling the development of a complete mechatronic system. Students gain an insight into the interaction between the various subjects, including the dynamic conditions within systems:

COMPETENCE GOALS

In the third semester, students attain the following academic competencies:

- the ability to analyse, specify and design passive and active analogue electronic circuits;

- an understanding of the physical basic principles in actuators and sensors, and an ability to use these as components in the development of mechatronic systems;

- an insight into, and understanding of, the interaction between mechanics and electronics;

- the ability to understand and model dynamic problems in connection with mechatronic systems;

- the ability to specify, design and develop mechatronic products, in which a mechanical system is regulated by an analogue electronic system that is central to the functionality; and

- the ability to integrate mechanics, electronics and software into a functioning mechatronic system.

SEMESTER STRUCTURE

MC-DIM – Develop Intelligent Dynamic Mechatronic Systems (20 ECTS)
MC-DYN – Dynamic systems (10 ECTS)

Both modules are compulsory.

CONTEXT

The semester consists of two modules, MC-DIM (Develop Intelligent Dynamic Mechatronic Systems) and MC-DYN (Dynamic systems).

In MC-DIM, students complete a semester project (SPRO3M – 10 ECTS) that deals with the development of an intelligent mechatronic system, in which the electronics and software must be developed, while the mechanics must be designed, specified and manufactured externally. The ac-

companying teaching 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.

In MC-DYN, the focus is on the theoretical aspect of dynamic mechanical systems and the modelling of electro-technical systems in the academic fields MECH2 – 5 ECTS and EPHYS – 5 ECTS.

§9 Description of fourth semester

SEMESTER THEME

Construct Mechatronics

VALUE ARGUMENTATION

In the fourth semester, the focus is on students being able to apply their knowledge of the development process of mechatronic products combined with the ability to construct power circuits and validate the quality of the constructed mechatronic system. The third semester is consolidated by the introduction of Power Electronics, Thermodynamics and Computer Aided Engineering, which form a significant theoretical foundation for the development of advanced mechatronic systems. Students also choose an elective, course. This semester results in a general specialization in the field of mechatronics and initiates a profiling that may continue with actual specialization at graduate engineer level.

COMPETENCE GOALS

In the fourth semester, students attain the following academic competencies:

- the ability to model and implement a mechatronic system or product while taking into account the context of which it forms part;

- the ability to use element analysis to solve simple plane, axial and spatial structures;

- the ability to construct power electronic circuits and understand control of power circuits;

- the ability to validate solutions with respect to production quality, tolerances and life time estimates;

- theoretical ballast in thermodynamic conditions in connection with mechatronic systems; and

- Specialisation through the choice of an elective course, for instance:

    o Electromagnetic waves; or

    o Development of object-oriented programs for embedded systems; or

    o AC and DC motors and their application as actuators.

SEMESTER STRUCTURE

MC-COM – Construct Mechatronics (15 ECTS)
MC-CAE – Computer Aided Engineering (5 ECTS)
MC-THER – Thermodynamics (5 ECTS)

The above modules are compulsory. In addition, an elective course equivalent to 5 ECTS must be chosen.

CONTEXT

The semester consists of three modules, MC-COM (Construct Mechatronics), MC-CAE (Computer Aided Engineering) and MC-THER (Thermodynamics). In addition, students must choose an elective course.

MC-COM consists of a semester project (SPRO4M – 10 ECTS) where the focus is development of a (mechatronic) product or system with emphasis on the Power Electronic part. This is supported by the academic field PWE (Power Electronics – 5 ECTS).

In MC-CAE and MC-THER, teaching is provided in Thermodynamics and Computer Aided Engineering – a necessary theoretical foundation that will support the development of advanced mechatronic products.

§10 Description of fifth semester

SEMESTER THEME

Experts in Teams

VALUE ARGUMENTATION

In this semester, all the knowledge, skills and competencies gained from the previous four semesters are activated, put into practice and further developed in the context of: Each student being an expert playing his/her particular role in the development of a bigger "real world" project with many stakeholders. The idea of the theme is:

Students will gain experience of the completion of project work in a context of 'innovation and entrepreneurship'. The work of the project is organized into a virtual company, and students must complete all phases of development from the idea to the building of a fully functional prototype, taking into account finance, external suppliers, etc. In addition, the semester includes two elective courses (a total of 10 ECTS), in which students can consolidate their knowledge, skills and competencies and thus become specialists, - or in other words: become 'experts in the team'.

COMPETENCE GOALS

In the fifth semester, students attain the following academic competencies:

- the ability to model control system in the context of a mechatronic product;

- experience of project management, the construction of the required organisation and financial management of a project;

- knowledge of how to collaborate on a major project requiring different skills;

- the ability to understand their own roles in the work of the project;

- an understanding of the philosophical aspects of science; and

- the attainment of further specialisation of two elective courses, for example:

  o Optics and Sensor Technology;

  o Clean Room Manufacture;

  o The application of real-time operating systems;

  o The modelling of digital systems using VHDL;

  o Mechanical vibrations.

SEMESTER STRUCTURE

MC-EXS – Experts in Teams (15 ECTS)

MC-COE1 – Control Engineering (5 ECTS)

The above modules are compulsory. In addition, two elective courses equivalent to 10 ECTS must be chosen

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 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 organizing in a professional manner. Engineering methodology forms an integral part of the project work, and particular emphasis is placed on project management, organization and roles on the project. There is a focus on the application of the methods of research and science theory. The module includes the academic field: Science Theory.

The module MC-COE1 (Control Engineering) adds competencies in developing control systems for mechatronic products thus giving the possibility of finalizing the project work including the necessary control part.

EXCHANGE POSSIBILITIES

The faculty recommends and supports, that students go for a one semester exchange at another university. On the mechatronics 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 control course (MC-COE1 – 5 ECTS) 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 sixth semester

SEMESTER THEME

The theme of the sixth semester is the Bachelor project.

VALUE ARGUMENTATION

The focus of the semester is on students demonstrating an overall view, independence and mastering of the core skills taught in the study programme. This is documented in the Bachelor project. The semester is supplemented by two advanced modules: MC-COE2 (control Engineering) and MC-AEM (Applied Electromagnetics) as well as an elective course. This provides students with theoretical insight that can be applied to the bachelor project and is a prerequisite for any further studies.

COMPETENCE GOALS

Students gain:

- the application of control theory for solutions in mechatronic products;

- knowledge of numerical methods for the resolution of electrophysical problems;

- specialized knowledge through the selection of an elective course from one of the areas: Nanotechnology, Embedded Control Systems or Dynamic Mechatronic Systems; and

- the ability to complete a Bachelor project by making use of the core skills taught in the study programme.

SEMESTER STRUCTURE

MC-BPRO – Bachelor project (15 ECTS)
MC-COE2 – Control Engineering (5 ECTS)
MC-AEM – Applied Electromagnetics (5 ECTS)

The above modules are compulsory. In addition, an elective course equivalent to 5 ECTS must be chosen.

CONTEXT

The semester consists of three modules, the Bachelor project, a theory course in Control Engineering - MC-COE2 and Applied Electromagnetics - MC-AEM as well as an elective course worth 5 ECTS.

§12 External examiners and Academic Study Board

The study programme falls under the jurisdiction of the Academic Study Board of the Faculty of Engineering and the Engineering Study Programmes' nationwide external examiners.

§13 Entry into force and amendments

1. Approved by the Academic Study Board of the Faculty of Engineering and the Director of Studies on behalf of the Dean of the Faculty of Engineering on 20 August 2008.

2. Study start September 2012 approved by the Academic Study Board of the Faculty of Engineering and the Director of Studies on behalf of the Dean of the Faculty of Engineering on 13 April 2012 (Version 1.0).

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

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

Approved on 10 April 2014 by the Academic Study Board of the Faculty of Engineering