

Chapter 9

The programme specific part of the curriculum for:

MASTER OF SCIENCE (MSc) IN ENGINEERING (INNOVATION AND BUSINESS)

Curriculum of 2012, Version 1.2

Applicable to students admitted September 2012

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

Innovation and Business is a master of science in engineering that combines innovation, technology and business disciplines and courses. The students become business-oriented engineers (I&B engineer). In a collaborative and participatory way they integrate business, technology and use. The I&B engineer is able to deal with different types of innovation challenges both in small (entrepreneurial) and in larger enterprises (project managing). The I&B engineer is internationally oriented and is able to think globally. Thus, he can respond productively to challenges in our complex and rapid evolving society. A master of science in Innovation and Business provides the students with special core competencies within the following areas:

- Creativity, Design and Innovation skills for stimulating innovation in companies
- Elaborated skills in Mechatronics related to production technologies, systems and corresponding software
- Product and production-driven entrepreneurship
- Collaborative skills to understand and facilitate the participatory process between stakeholders and organizations
- Competencies in sustainable business development, green logistics and production setup
- Knowledge about business administration and marketing for evaluating market and business opportunities

These combined engineering, business and innovation competences enable the graduate to work in various jobs in modern companies, where interdisciplinary and cross-functionality is a path to success. Understanding the process from development of product ideas to specify and realise green production and business makes the graduate an important link between specialists within an organization. Emphasizing the international dimension during the education fosters global opportunities. Finally, graduates have the possibility to pursue a career within academia. Possible job profiles for a graduate are:

- **Innovation Engineer**
The Innovation engineer is able to work with innovation in companies regarding products, production and businesses. The candidate is able to analyse, understand and interpret complex technology to applications in innovative solutions. His oral and written communication skills allow him/her to exchange and realize ideas creatively and dynamically. The profound economic and technological knowledge allows him/her to recognize and realize market and technology-oriented ideas faster and better than the competitors.
- **Innovation Manager**
The Innovation Manager is able to coordinate and lead the innovation development process based on open and participatory innovation. His communicative, economic and technological skills allow him/her to manage innovation development across different departments and across companies. The candidate is a team player and is able to orchestrate the interdisciplinary and multidimensional process of innovation, independently of whether this process is situated on the institutional or the corporate level.

- **Business Developer**
The Business Developer/Innovator is able to detect and analyse signals for change and development on the corporate level, as well as on the institutional or regional level, in order to develop bearing strategies that are both economically and technologically sound. His/Her specific communication skills together with knowledge of economies and technology allow him/her to coordinate and mediate between the institutional level and the corporate level.
- **Entrepreneur**
Entrepreneurs who are willing to combine expertise and entrepreneurship are able to take the challenge to develop, market, and manage their own ideas from the beginning through to the end. Graduates of Innovation and business acquire the needed skills to develop their own products, perform the market research and to setup the logistics and production facilities to realise the business.
- **System Integrator**
The Innovation and Business candidate has a good overview of mechatronics technologies and when it comes to new solutions in mechatronics (energy solutions, medico, welfare, high tech manufacturing, transportation etc.) the candidate is able to specify and design the solution in a sustainable way combining economic, environmental and social aspects.
- **Operations Engineer and Manager**
The candidate has the economic and technological knowledge as well as the communicative skills to develop, adjust and coordinate industrial companies' supply chains?, distribution and production, according to demand from global markets. The candidate focuses on sustainability and the circular economy related to the Cradle to Cradle strategies and methods.
- **Researcher (PhD-Student)**
The graduate is qualified to enter academia and pursue an academic career within university. Society's demand for knowledge and innovation as a means to gain competitive advantage and improve quality of life increases the need for innovation researchers. To develop businesses of the future, research in future products, innovation, production and productivity is crucial.

§2 Competence profile of the education

With a Master of Science in Engineering in Innovation and Business, the graduate possesses solid competences within the field of innovation and production based business development within mechatronics technologies. The education will enable the students to handle the innovation process from exploring and discovering new ideas to planning, managing and finally specifying and realizing own production business ideas or concepts. The students have gained the knowledge to start up their own company or to proceed with a career in industry or academia.

The graduate will have acquired the following overall knowledge, skills and competencies.

KNOWLEDGE

- Is able to understand the complexity and diversity of developing mechatronics products and production in a quickly changing environment and managing a project in innovation of technology, product or business.
- By working with innovation in practice and collaborating with industry and financial partners, the students gain understanding in starting up businesses.
- Understanding of the innovation process as a dynamic and participatory process with many stakeholders.

SKILLS

- Is able to master the innovation process and select and realize promising technology, product and business ideas.
- Skills in the collaborative and participatory design process including open innovation.
- Product and production development techniques, project management and related working methods.

COMPETENCES

- The student is able to analyse, plan and organize an innovation process or project on the basis of modern innovation methods.
- Can understand, reflect upon, interpret and apply knowledge based on advanced international research, by applying and evaluating different scientific methods and using them in relation to applied scientific writing to e.g. industry.
- Is able to understand and apply design thinking and design approaches, including mapping techniques, modelling, games and simulation methods.
- Is able to apply advanced theoretical and practical knowledge in the development and production of mechatronics, enabling the student to participate in development activities in industry.
- Entrepreneurship competences by being able to combine technical and business competences.

Is able to analyse, evaluate and search for business opportunities based on a combination of the market driven and the technology driven approach.

§3 Subject columns of the study programme

The competences are acquired by studying the topics listed below during the programme.

Innovation management

- Innovation processes
- Innovation practice
- Open Innovation
- Participatory Innovation
 - Value networks
 - Customer/user innovation
- Project management methods

Business Development and Entrepreneurship

- Company analysis
- Establishment of a business/company
- Business plan development and implementation
- Raising venture capital
- Technology assessment and management

Business administration and management

- Management accounting and Cost measurement
- Investment, financing, budgeting
- Organization design and changes
- Organizational management and strategy
- Marketing in a company or organization
- Global marketing: B2B, B2C
 - Internet commerce

Design and creativity

- Design thinking
- Design studies
- Design Methods and tools
- Professional roles (participatory innovation, social design and human centred design)
- Creativity techniques, Barriers to creativity, Creativity in organizations.

Product development Mechatronics

- Integrated and systematic Product Development
- Design and build mechatronics products
- Design for Manufacturing
 - Product documentation for preparing manufacturing
- Mechatronics Embedded control system solutions
- Developing Engineering Applications for Mobile Platforms

Production Mechatronics

- Production in industrial companies (metals and plastics industry)
- Operations management
 - Supply chain management, Green logistics Cradle to Cradle
 - Quality management
 - Lean Principles
 - Simulation and modelling
- High tech production and automation
- Microtechnology methods (selective)
 - Cleanroom production

Scientific methods

- Academic writing skills
- Problem formulation and literature review
- Research design
- Research methods
- Collecting, analysing and interpreting data

Personal competences:

- Communication
- Analytical thinking
- Critical and independent thinking
- Reflection
- Creativity
- Collaboration
- Process management

§4 The semester themes of the study programme:

The study programme has on the master level the following semester themes:

- 1st semester: Innovation Technology and Business
- 2nd semester: Innovation Practice
- 3rd semester: Specialisation.
- 4th semester: Master Thesis

On the 3rd semester three different tracks are offered:

- I. **Big Master**, the student can choose to make a big 40 ECTS master thesis. On the 3rd semester they start to survey literature and prepare e.g. empirical studies or developments. In this case, the student has to select two electives.
- II. **In-company period**, the student can choose a 15 ECTS Internship in an industrial company on the 3rd semester resulting in a smaller 30 ECTS master thesis. In this case, the student selects only one elective on the 3rd semester.
Entrepreneurship, the students can focus on developing their own business on the 3rd and 4th semester. This can be individually or in collaboration with fellow students. These students have 15 ECTS on the 3rd semester to collect knowledge and develop their business idea. For this track, there is only one elective on the 3rd semester.

§5 Structure and Semester modules

4.	Master thesis																							
3.	IBDIN Dynamics of Innovation				Elective				Elective* a) Master thesis (10 ECTS) b) F-VF:- In-company period (15 ECTS) c) IBEST: Entrepreneurship Training (15 ECTS)						Elective				NAMDB2 Mechatronics Design and Build 2					
2.	IBPIN Participatory Innovation								IBOIM Open Innovation Management				IBDAMP Developing Engineering Applications for Mobile Platforms				PTECH Production Technology				NAMDB1 Mechatronics Design and Build 1			
1.	IBBPR Business Practice								IBITB Innovation of Technology and Business								MCIECS Introduction to Embedded Control Systems							
ECTS POINTS	1																				1			

* See § 4 for how to combine the electives

§6 Description of the 1st semester

Semester theme: Innovation, Technology and Business

VALUE ARGUMENT

Today, innovation solutions are often complex and interdisciplinary, for example when it comes to innovation within welfare, medico, energy, where many parties and stakeholders are involved. At this semester, we want to present the journey from innovation through technology to business.

The 1st semester introduces the students to different perspectives on innovation and they discover and experience the innovation process. The students learn about innovation theories and methods and how innovation and business is understood and managed in practice. The students work with industrial companies to investigate how professional organisations manage innovation. The students have at this semester to work with mechatronics technology from a theoretical point of view through research publications as well as through practical hands-on courses. The students will learn about business development and how to develop an efficient business plan. The students have to perform practical innovation by in a creative way transform researched technology to a physical product and argue the business potentials. The students will in a practical way discover the entire value chain in business development. The knowledge provided will enhance the students' capabilities within innovation practice as well as enhance their competencies within a specific business or technology subject. This semester prepares them for the coming semesters, where the gained understanding should be used in other related innovation courses as well as in the technical or business courses.

LEARNING OBJECTIVES for the 1st semester are the following

KNOWLEDGE

- Be able to understand the complex innovation process and the management of innovation based on different theoretical perspectives as well as industrial cases
- Business knowledge and what is part of a business plan
- Basic understanding of scientific methods

SKILLS

- Be able to understand and demonstrate in practice the innovation in the value chain from technology survey to a product and business development
- To read and interpret technical research publications and by combining this with the practical mechatronics disciplines be able to reflect and creatively work with product and business development

COMPETENCES

- Coherent/Holistic view of mechatronics solutions and as a system integrator build basic mechatronics systems and embedded control systems

- Be able to understand and apply scientific methods in performing basic research, and be able to present findings in a structured presentation as well as in academic writing
- Meaningfully combine the different theoretical fields and practices into a fluent innovation process

MODULES

The 1st semester contains the following modules:

IBBPR - Business Practice (10 ECTS)

IBITB - Innovation of Technology and Business (10 ECTS)

MCIECS – Introduction to Embedded Control Systems (10 ECTS)

The modules IBBPR, IBITB, MCIECS are constituent, obligatory modules.

CONTEXT

The semester provides advanced introduction to innovation, mechatronics, business practice and scientific methods.

IBBPR: The course deals with conceptions of the innovation process in industrial organisations:

- The complex relational view on industrial practice.
- The role of collaboration in the innovation of new products and services.
- The relationship between design and innovation.
- Practical organization of co-innovation activities.
- Business modelling with design materials.

As this is a research field in rapid development, lectures will be based on conference papers, and students will learn to write a short scientific argument, in which they relate their own practice to project experience and literature.

IBITB: The course will provide students with knowledge and competence in how to integrate innovation, technology and business. The students will experience the practice of creating innovation in a multi-disciplinary context, and as “Innovation Engineers”, perform own innovative solutions. The proposed innovative solutions will be assessed from a commercial point of view and presented in a final business plan.

Furthermore, the course will cover introduction to scientific methods and research. The students will learn about researching the process, work with scientific articles, and learn how research questions are formulated and how a research design is developed. In relation to the innovation practice the students will learn how to acquire, analyse and disseminate knowledge from various information sources.

MCIECS: The scope of the course is to introduce students to basic embedded technologies and methods – both from a software and a hardware perspective. The teaching is project

oriented, and will give training in object oriented software development and development of digital hardware using a hardware description language. The course is project-based, where the scope and subject will be chosen depending on the background of the students, emphasizing specific areas such as embedded control systems architecture and principles of operation.

§7 Description of the 2nd Semester

Semester theme: Innovation Practice

VALUE ARGUMENT

Innovation can be performed on an individual basis, but in reality innovation is mostly performed in participation among people and stakeholders. Innovation challenges are complex where new methods and social interactions are required.

On this semester, students will learn “Innovation Practice” – the ability to couple technology, use and business. Students will work with participatory innovation and the newest theories and methods in open innovation. Students will learn to rethink products and production based on new material and production processes and in cases where mechatronics become still more based on software at different platforms. Outsourcing and off shoring is no longer given in industrial businesses, where we have to teach students how to increase productivity and use new production technologies to stay competitive.

On the 2nd semester, students are introduced to the theory and methodologies in participatory innovation including choice of appropriate methods for user studies, sense-making, user co-creation etc. They have to organize an innovation project with participation of different stakeholders from design innovators, technical engineers, users and business people. The project has its foundation in the “mechatronics design and build” domain, while it is applying the methodologies and principles from open innovation and how to manage innovation among many stakeholders. Students will get a deeper understanding of mechatronic design and the confidence and knowledge to undertake mechatronic design and build projects.

In the course Production Technology, students experience how industry develops products and production technologies. The students get insight in the design for manufacturing methodologies and in practice experience the possibilities and limitations in different production technologies.

The first elective course is where students as examples can select DAMP with APP development or solar energy, depending on their personal interests and future profile. The electives may change according to the interest and background of the students.

LEARNING OBJECTIVES for the 2nd semester are the following

KNOWLEDGE

- Be able to understand different perspectives on and challenges related to managing open innovation.
- Be able to understand the use of selected materials and production processes.

SKILLS

- Be able to use and apply theories of user-driven innovation, initiate and facilitate conversations about innovation between stakeholders.
- Organise innovation projects with user participation.

- Be able to understand, analyse and perform advanced issues concerning mechatronics design and build seen from a system integrator's point of view.

COMPETENCES

- Be able to define research problems and make an appropriate research design, including research question, literature review, methodology and findings.

MODULES

The 2nd semester contains the following modules:

IBPIN - Participatory Innovation (10 ECTS)

IBOIM – Open Innovation Management (5 ECTS)

PTECH – Production Technology (5 ECTS)

NAMDB1 – Mechatronics Design and Build 1 (5 ECTS)

IBDAMP: Developing Engineering Applications for Mobile Platforms (5 ECTS)

The modules IBPIN, IBOIM, PTECH, NAMDB1 and IBDAMP are constituent, obligatory modules.

CONTEXT

IBPIN: This 10 ECTS module introduces history and approaches of user-driven innovation (usability engineering, participatory design, design anthropology, lead-user approach and others). It discusses how these approaches play out in an industrial organisation: The uptake of provocative user knowledge, collaborative sense-making, user empathy and identity forming, social shaping of innovation, participatory business modelling. The course is project based and will embrace the topics from Open Innovation and mechatronics design and build.

IBOIM: The course presents the students with different perspectives on and challenges related to managing open innovation, which relies on the distributed nature of innovative knowledge, technology and commercialization opportunities. During the course, the students will increase their understanding about the theory and practice of open innovation, they will develop their ability to identify, grasp and analyse scientific and practical material, synthesize this material, and present their (critical) view on relevant concepts, theories and practices. Finally they will improve their analytic and decision-making competences in the context of open innovation.

PTECH: In the course students experience how industry develop products and production technologies. The students get insight in the design for manufacturing methodologies and in practice experience the possibilities and limitations in different production technologies through direct contact and visits to industrial companies. The students will experience the interaction between design, quality, manufacturing and economy. They will get insight in the processes from CAD, CAM to the shop floor control including CNC and automation. Upcoming technologies like e.g. rapid manufacturing are introduced.

NAMDB1: The course will provide students with the confidence and knowledge to undertake mechatronic design and build projects. This is done by exposing students to research topics associated with Mechatronics, Embedded Systems and Control Engineering. The students will be introduced to the design rules and principles when designing and building mechatronics elements and systems.

IBDAMP: The course introduces the development of engineering related mobile applications for different platforms. The course will allow students to develop skills for creating and deploying applications with a particular emphasis on engineering projects and integration of mechatronic devices. The course offers a systematic treatment of various aspects of mobile platforms development as well as integration of sensors, for example by wireless communication. The students are expected to use this course as the basis for developing their own application related to an engineering project.

§8 Description of the 3rd Semester

Semester theme: Specialisation

VALUE ARGUMENT

Today, we know much more about the basic innovation competences, which to a wide extent are about navigating in complex and political relationships e.g. public and private institutions. This requires a wide knowledge of different science disciplines that ask for new disciplines in innovation engineering.

The purpose of the 3rd semester is to present the students to the multidisciplinary field of innovation research. Thus, the students will learn how to orient themselves on the map of innovation research and further understand interconnections, and to creatively apply and visualize the knowledge gained in the courses.

In the course Dynamics of Innovation, students learn to understand innovation as a social process where interactive learning between different actors (e.g. suppliers/producers, customers/users, universities, public procurers) is a central element.

Students will get advanced knowledge within the field of mechatronics development (design and built) upon the knowledge gained in the previous semester.

The researchers will on the 3rd semester involve students in actual research to demonstrate different research topics and scientific methods. On the 3rd semester, it will be possible to choose two elective courses according to the specialisation and interest of the students. The one elective will be in the business category with entrepreneurship or value chain analyses. The other elective will be on the production part where the choice can be between Micro Technology Production or Glocalized Production.

On the 3rd semester, students have to choose one out of three tracks:

- I. Big Master. Building upon the previous semesters this track starts up the master project corresponding to 10 ECTS. On this track, two elective courses are available, e.g. one business and one technical course.
- II. In-company period. Students can take an internship in an industrial company to work with innovation projects in the company. The innovation project is typically leading up to the master project and will involve the relevant professor. These students have the option to choose one elective course.
- III. Entrepreneurship. Students focusing on entrepreneurship can work on their own business idea and choose one elective course and master project related to the topic.

LEARNING OBJECTIVES for the 3rd semester are the following:

KNOWLEDGE

- Basic understanding of how to navigate in complex organizations with many stakeholders and political relationships
- Coherent/holistic view on innovation and business to such an extent that a research profile/topic can be selected.

- Understanding advanced production processes and concepts applicable to manufacturing businesses of the future.

SKILLS

- Be able to define relevant issues related to own entrepreneurship ideas according to technology, product, production, marketing, financing etc. or
- Through an internship in a company, students can challenge the company on innovation principles and how to apply innovative technologies seen from an innovation architect's point of view.

COMPETENCES

- Be able to understand, analyse and perform advanced issues concerning mechatronics design and build seen from a system integrator's point of view

MODULES

The 3rd semester contains the following modules:

IBDIN – Dynamics of Innovation (5 ECTS)

NAMDB2 – Mechatronics Design and Build 2 (5 ECTS)

Elective tracks, choose one of the three tracks:

- a) THS – Thesis (10 ECTS) plus 5 ECTS elective
- b) F-VF-U1 – In-company period (15 ECTS)
- c) IBEST - Entrepreneurship Training (15 ECTS)

Electives: one technical and/or one business course:

Technical production elective as examples:

T1. Globalized Production, where the student learns about global challenges for industrial production business and how to work with high automated production facilities and global local supply chains

T2. Microtechnology production, where students learn about clean room processes related to Nanotechnology

Business elective as examples:

B1. Behavioural Entrepreneurship It aims to provide an understanding of entrepreneurship from the point of view of a practicing entrepreneur, as well as from the point of view of the policymaker.

B2. Value Chain Analysis is a holistic management concept of how business processes within and between companies are coordinated to improve the supply chain deliverables.

The modules IBDIN and NAMDB2 are constituent, obligatory modules.

CONTEXT

IBDIN: The course IBDIN (5 ECTS) views innovation as a social process, where interactive learning between different actors (e.g. suppliers/producers, customers/users, universities, public procurers) is a central element.

NAMDB2: The aim of the module is to provide students with the opportunity to carry out research-oriented design and build projects in the general area of Mechatronics. On this semester, the final prototype has to be developed. The available projects will reflect the research interests of the Mads Clausen Institute which are at the same time relevant and of interests of the students. Projects will, for example, encompass smart actuators (modelling and control), embedded systems and control engineering for a variety of different applications.

THS - Thesis: The students should work on a thesis proposal during this course. The selection of the topic should be within one of the key areas of the Innovation and Business education. During the course, the content of the master thesis will be discussed including: Formulating a research problem/question, writing a critical literature review and propose an appropriate research design/methodology.

F-VF-U1 – In-company period: The purpose is that students work closely with an industrial company. Students are responsible for making the agreement with the company and to get a company tutor. During the internship, students have to analyse and document the innovation process and the functions in the company and reflect critically to these activities. By means of critical thinking, students have to challenge the company with new theories and methodology for performing Innovation.

IBEST: The purpose is that students work on their own Entrepreneurial ideas focusing on becoming an entrepreneur setting up a new business. The student or group of students are able to point at a market, a market need, a product idea, new technology or something that may lead to a new business. A mentor in a company or even a sponsor may be found that can challenge and assist the business idea and assist the students in taking the next steps.

§9 Description of the 4th Semester

Semester theme: Master Thesis

VALUE ARGUMENT

The student shall through the selected problem document his/her engineering-specific competencies attained during his/her work with a limited, relevant and engineering-specific subject.

LEARNING OBJECTIVES for the 4th semester are the following

KNOWLEDGE

- Be acquainted with relevant engineering skills based on the highest level of international research.
- Attain good understanding of - and be able to reflect on - relevant knowledge.
- Apply scientific methods and tools.

SKILLS

- Identify scientific problems and formulate research questions.
- Be able to identify and review the relevant scientific literature and develop a conceptual framework to empirical work.
- Assess, select and apply scientific methods, tools and competencies within the subject area of the course
- Explain and discuss relevant professional and scientific problems.
- Present novel analysis and problem-solving models.
- Disseminate research-based knowledge.
- Set up a clear framework for the thesis including a proper scientific structure.
- Be able to communicate in a clear and understandable manner.

COMPETENCES

- Be able to independently initiate and carry out discipline-specific and cross-disciplinary cooperation and to assume professional responsibility.
- Manage work and development situations that are complex and unforeseen and require new solution models.
- Take responsibility for own professional development and specialization.

MODULES

The 4th semester contains:

Master Thesis (30 ECTS)

The Master Thesis module is a constituent, obligatory module.

§10 Qualifying Exams for Admission

1. Bachelors with automatic claim for admission

BSc (Eng) in Innovation and Business

Bachelors of Science in Engineering (Innovation and Business) from the Faculty of Engineering at the University of Southern Denmark have an automatic claim for admission on the MSc (Eng) in Innovation and Business study programme.

2. Other qualifying bachelor exams (from the University of Southern Denmark)

BSc (Eng) in Product Development and Innovation

Bachelors of Science in Engineering (Product Development and Innovation) from the Faculty of Engineering at the University of Southern Denmark are immediately entitled to admission for the MSc (Eng) in Innovation and Business study programme.

BEng in Interaction Design

Bachelors of Engineering in Interaction Design from the Faculty of Engineering at the University of Southern Denmark are immediately entitled to admission for the MSc (Eng) in Innovation and Business study programme.

BEng in Mechatronics

Bachelors of Engineering in Mechatronics from the Faculty of Engineering at the University of Southern Denmark are immediately entitled to admission for the MSc (Eng) in Innovation and Business study programme.

3. Other qualifying exams

BSc (Eng) and BEng from other universities

Bachelors of Science and Bachelors of Engineering from other Danish and foreign universities as well as other applicants with a corresponding education can be admitted to the study programme of MSc (Eng) in Innovation and Business. Such an admission is subject to an individual assessment of whether the applicant's academic qualifications correspond to those of the abovementioned BSc (Eng) / BEng from the Faculty of Engineering at the University of Southern Denmark.

§ 11 External examiners and Study Board

The study programme belongs under the Academic Study Board of the Faculty of Engineering and the Danish corps of external examiners for engineering education. Modules offered by the Faculty of Social Sciences belong under corps of the external examiners for social sciences.

§ 12 Entry into Force

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 20th August 2010.
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 21st June 2012 (Version 1.0).
3. 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 17th August 2012 (Version 1.1).
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 15th May 2013 (Version 1.2).