



AALBORG UNIVERSITY
DENMARK

The Faculty of Engineering and Science
The Study Board of Industry and Global Business Development

Curriculum for the MSc Programme in Operations and Innovation Management (cand.polyt.)

Aalborg University

September 2016

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Eskild Holm Nielsen
dekan



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Preface

Pursuant to Act 261 of March 18, 2015 on Universities (the University Act) with subsequent changes, the following curriculum for the Master's programme in Operations and Innovation Management is stipulated. The programme also follows the Joint programme regulations and the Examination Policies and Procedures for the Faculties of Engineering, Science and Medicine.

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Chapter 1: Legal Basis of the Curriculum, etc.

1.1 Basis in Ministerial Orders

The Master's programme in Operations and Innovation Management is organised in accordance with the Ministry of Science, Innovation and Higher Education's Order no. 1520 of December 16, 2013 on Bachelor's and Master's Programs at Universities (the Ministerial Order of the Study Programs) and Ministerial Order no. 670 of June 19, 2014 on University Examinations (the Examination Order) with subsequent changes. Further reference is made to Ministerial Order no. 258 of March 18, 2015 (the Admission Order) and Ministerial Order no. 114 of February 3, 2015 (the Grading Scale Order) with subsequent changes.

1.2 Faculty Affiliation

The Master's programme falls under the Faculty of Engineering and Science, Aalborg University.

1.3 Board of Studies Affiliation

The Master's programme falls under the Board of Studies of Industry and Global Business Development under the School of Engineering and Science.

1.4 Body of External Examiners

The Master's programme falls under the External Examiner Corps of higher education of engineering (mechanical engineering).

Chapter 2: Admission, Degree Designation, Programme Duration and Competence Profile

2.1 Admission

Applicants with a legal claim to admission (retskrav):

Applicants with one of the following degrees are entitled to admission:

- Bachelor of Science in Manufacturing and Operations Engineering, Aalborg University
- Bachelor of Science in Global Business Engineering, Aalborg University
- Bachelor of Engineering in Export Technology, Aalborg University
- Bachelor of Engineering in Mechanical Engineering, Aalborg University

Applicants without legal claim to admission:

Applicants with one of the following degrees meet the admission requirements:

- Bachelor of Engineering in Export, IHK
- Bachelor of Engineering in Global Business Development, VIA

Students with another Bachelor degree may, upon application to the Board of Studies, be admitted following a specific academic assessment if the applicant is considered as having comparable educational prerequisites. The University can stipulate requirements concerning conducting additional exams prior to the start of study.

2.2 Degree Designation in Danish and English

Students completing the master's programme are entitled to the Danish designation *civilingeniør, cand.polyt. i værdikæder og innovationsledelse*. The English designation is: Master of Science (MSc) in Engineering (Operations and Innovation Management).

2.3 The Programmes' Specification in ECTS Credits

The Master programme is a 2-year, research-based, full-time study programme. The programme is set to 120 ECTS credits.

2.4 Competence Profile in the Diploma

The following competence profile will appear in the diploma:

A graduate of the Master's programme has competencies acquired through an educational programme that has taken place in a research environment. The graduate of the Master's programme can perform highly qualified functions on the labour market on basis of the educational programme. Moreover, the graduate has prerequisites for research (a PhD programme). Compared to the Bachelor's degree, the graduate of the Master's programme has developed her/his academic knowledge and independence, so that the graduate is able to independently apply scientific theory and method in both an academic and occupational/professional context.

2.5 Competence Profile of the Programme

The graduate of the Master programme exhibits the following characteristics:

Knowledge

- Have international-level knowledge, based on state-of-the-art research in the field of Operations and Innovation Management, in particular disciplines that take a management engineering perspective on the analysis of complex problems in complex industrial systems, and the design and implementation of innovative solutions to such problems, based on an integration of technological, organizational and managerial aspects. These disciplines include organization/enterprise analysis, engineering and design; operations strategy; business intelligence and performance management; and innovation and change management
- Understand and are able to reflect, on a scientific basis, on the technological, organizational, managerial, industrial and competitive aspects of Operations and Innovation Management problems and solutions.

Skills

- Are skilled management engineers who are able to:
 - Work systematically, analytically and solution design-oriented
 - Apply a deep understanding of the technological, organizational, managerial, industrial and competitive aspects of Operations and Innovation Management in analyzing complex problems and designing and implementing solutions in a wide range of empirical settings, in particular industrial and professional service settings
 - Evaluate, select among, and apply scientifically-based management engineering knowledge, methods and tools related to Operations and Innovation Management to analyze problems and design and implement solutions, alone as well as in a collaborative context, e.g. cross-functional projects
- Can communicate research-based knowledge, methods and tools and discuss professional and scientific problems and solutions with both peers and non-specialists.

Competencies

- Can manage work and development in complex and unpredictable situations requiring innovative solutions
- Can independently initiate and implement discipline-specific and interdisciplinary cooperation and assume professional responsibility within the area of Operations and Innovation Management
- Can independently take responsibility for own professional development and specialisation.

Chapter 3: Content and Organisation of the Programme

The programme is structured in modules and organised as a problem-based study. A module is a programme element or a group of programme elements aiming to give students a set of professional skills within a fixed time frame specified in ECTS credits, and concluding with one or more examinations within specific exam periods that are defined in the curriculum. Each semester has an overall theme which serves a focal point in both modules and the project work. The programme is based on a combination of academic, problem-oriented and interdisciplinary approaches and organised based on the following work and evaluation methods that combine skills and reflection:

- Lectures
- Classroom instruction
- Project work
- Workshops
- Exercises (individually and in groups)
- Teacher feedback
- Reflection
- Portfolio work.

The 3rd semester is allocated to gaining practical international experience. The semester will enable students to appreciate theoretical reflective work practice and cultural challenges. The aim of the semester is to

1. Gain practical experience within the subject field
2. Analyse and reflect on educational experiences and professional practice
3. Clarify the Master's Thesis topic.

The third semester offers different ways of organisation – depending on the student's choice of content; project work at Aalborg University, study visit at an educational institution in Denmark or abroad, voluntary traineeship with project work at a company in Denmark or abroad, or a semester programme that comprises cross-disciplinary programme elements composed by the student. The total work load of the semester has to be equivalent to 30 ECTS, of which up to 15 ECTS can be elective courses. The project may be finalized with a project report or in the form of a scientific paper, or, if the project is continued at the 4th semester, with a midterm evaluation. For further information about the organisation of the module please see the Joint programme regulations, chapter 2.3

3.1 Overview of the programme

All modules are assessed through individual grading according to the 7-point scale. All modules are assessed by external examination (external grading) or internal examination (internal grading or by assessment by the supervisor only).

Semester		Module	ECTS	Grading	Exam
1.		Organisation Analysis and Design	5	7-point scale	Internal
		Enterprise Engineering and Design	5	7-point scale	Internal
		Operations Development and Strategy	5	7-point scale	Internal
		Integrated Solutions - Designing Global Business Systems and Value Chains	15	7-point scale	External
2.		Innovation and Change Management	5	7-point scale	Internal
		Global Business Performance	5	7-point scale	Internal
		Business Intelligence and Analytics	5	7-point scale	Internal
		Global Implementation	15	7-point scale	Internal
3.	A	Operations and Innovation Management ¹	30	7-point scale	Internal
	B	Academic Internship ²	30	7-point scale	Internal
4.		Master's Thesis	30	7-point scale	External

¹ The project must be equivalent to at least 15 ECTS. Course modules approved by the Study Board for the specific study must supplement to a total of 30 ECTS. Course activity is evaluated and tested in accordance with the curriculum in which the course module is described. See 3.5.1.

² See 3.5.1.

3.2 1st semester

3.2.0 Course in Problem Based Learning and Student Responsibilities at Aalborg University

Title:

Problem Based Learning and Student Responsibilities at Aalborg University

Prerequisites:

None, but the course is compulsory for students not acquainted to the Aalborg PBL model

Objective:

Students who complete the module should:

Knowledge:

- Have knowledge about the organization at Aalborg university and where to get help in different matters
- Have knowledge about how to communicate both in your project groups but also when attending courses
- Have comprehension for how a semester is structured and about the different examination forms we use at Aalborg University
- Have comprehension for how project work and laboratory work is carried out at Aalborg University including safety issues in the laboratory
- Have comprehension for issues concerning plagiarism and the consequence when doing plagiarism
- Have knowledge about the software which are used in the study
- Have knowledge about the IT systems used and how to get started
- Have knowledge about the students counselor and what they can do

Skills:

- Be able to use problem based learning and perform group work when doing projects and courses at Aalborg University
- Be able to use Moodle i. e. for finding lecture plans, time schedules etc.

Competences

- Be able to apply the concepts, theories and methods for problem based learning and group work
- Be able to account for the considerations involved in the process of formulating project reports in practice.

Type of instruction:

Lectures, discussions and group work. The course will take place on Wednesday afternoons.

Form of examination:

Internal assessment during the course/class participation according to the rules in the Examination Policies and Procedures, Addendum to the Joint programme regulations of Faculty of Engineering and Science, Aalborg University. In this case the assessment is primarily based on the oral performance during the course, this means that the student has to be active during the course time and participate in discussions.

The course is an integrated part of the project for those not acquainted to the Aalborg PBL model, and is a precondition for participation in the project examination. In this way there will be no diploma for the course and it will not be visible on the academic transcripts.

Evaluation criteria:

Passed/not passed as stated in the Joint programme regulations

3.2.1 Organisation Analysis and Design (5 ECTS)

Title: Organisation Analysis and Design / Organisationsanalyse og design

Prerequisites: Students holding a bachelor degree from another university than Aalborg University must pass the course: Problem Based Learning and Student Responsibilities at Aalborg University, prior to sitting the exam.

Objective: Upon completion of the module, the student can:

Knowledge

- Account for theories and their paradigmatic underpinning on the design of industrial and professional service organisations
- Describe the impact of corporate and operations strategies, technologies and (competitive) environments on the design of such organisations

Skills

- Identify organizational design problems in industrial and professional service organization
- Operationalize these problems and collect relevant information concerning the industrial/competitive, strategic, technological, and organization design aspects describing these problems
- Analyse, evaluate and (re)design organisational designs in their contexts
- Apply concepts and theories to cases and (real-life) examples.

Competencies

- Visualize in, for example, exercises and cases of:
 - The paradigms in organisation theory
 - The principles of organisation design, including division and coordination of labour, and the impact of key contextual characteristics (including strategy, technology and environment) on organisation design parameters
 - Decision making, and the role of power, politics, control and conflicts in organisations
 - The similarities and differences between designing and managing start-ups, mature, expert-based, innovative, diverse, networked and virtual organisations
 - The needs, challenges, dilemmas, dualities and paradoxes in combining exploration and exploitation.
- Take the lead in diagnosing and solving problems in organization designs of various types of industrial and professional service companies

Type of instruction: The teaching is organized in accordance with the general forms of teaching, see chapter 3.

Exam format: Oral/written examination (for further information, please see the programme's study guide).

Evaluation criteria: Are stated in the Joint programme regulations.

3.2.2 Enterprise Engineering and Design (5 ECTS)

Title:	Enterprise Engineering and Design / Virksomhedsudvikling
Justification:	This course is aimed at methodologies for analysis, modelling, simulation, design, realization and implementation of large integrated enterprise systems as solution to complex business situation.
Objective:	Upon completion of the module, the student can: <i>Knowledge</i> <ul style="list-style-type: none">• Describe and classify theories, methods and tools related to enterprise engineering and design• Identify feasible approaches and frameworks for integrated business solutions• Understand enterprise architectures and typology• Explain theoretical and methodological foundations for analysis, modelling, simulation, design and evaluation of integrated business solutions• Design conceptualisation processes and orchestrate concept development in operations and supply chains• Recommend strategies for realization and implementation of solutions. <i>Skills</i> <ul style="list-style-type: none">• Apply enterprise engineering and design• Simulate and evaluate integrated solutions in operations and supply chain• Relate enterprise solutions to corporate strategies and development goals• Demonstrate proof of concepts, mock-ups and demonstrator models. <i>Competencies</i> <ul style="list-style-type: none">• Conceive and communicate complex solutions.• Analyse and reflect on own practice and approaches• Assess the need for synthesizing new knowledge
Type of instruction:	The teaching is organized in accordance with the general forms of teaching, see chapter 3.
Exam format:	Oral/written examination (for further information, please see the programme's study guide).
Evaluation criteria:	Are stated in the Joint programme regulations.

3.2.3 Operations Development and Strategy (5 ECTS)

Title: Operations Development and Strategy /Global produktionsudvikling og -strategi

Objective: Upon completion of the module, the student can:

Knowledge

- Understand configuration and design of operations systems in the manufacturing and service environments and demonstrate an in-depth knowledge of related theories and practices
- Describe and explain operations system performance objectives (cost, quality, flexibility, speed and dependability) and their change over time.
- Account for various perspectives on performance of operations systems (including focus, trade-off and synergies perspectives)
- Describe and explain structural and infrastructural decisions of operations systems design, including process technology, technology development and transformative effects of technology on operations systems
- Understand and demonstrate the importance of alignment between performance objectives and operations systems design through operations strategy matrix tool

Skills

- Use and evaluate appropriate methodologies and approaches to operations system conception, design, implementation and operation (CDIO)
- Analyze and evaluate different choices for strategic design of global operations systems and operations development strategies
- Initiate operations systems improvement and re-organizations processes and their implementation in the context of contemporary global operations

Competencies

- Diagnose problems in operations systems designs both in the manufacturing and service environments
- Conceive and design operations systems and their continuous development
- Take responsibility for the implementation and control of operations systems development

Type of instruction: The teaching is organized in accordance with the general forms of teaching, see chapter 3.

Exam format: Oral/written examination (for further information, please see the programme's study guide).

Evaluation criteria: Are stated in the Joint programme regulations.

3.2.4 Integrated Solutions - Designing Global Business Systems and Value Chains (15 ECTS)

Title: Integrated Solutions - Designing Global Business Systems and Value Chains / Integreerede løsninger - Design af globale forretningssystemer og værdikæder

Objective: Upon completion of the project module, the student can:

Knowledge

- Account for the relationships between theories on operations strategy/development and organization/enterprise analysis, engineering/design operations
- Understand the role for and the deployment of strategic and technological choices in the design of (global) companies, supply chains and production networks
- Show how to operationalize theoretical contributions to practical settings

Skills

- Analyze and develop an integrated solution to a practical problem, usually in the form of a project developed in and together with a company. The project theme is integrated solutions and normally requires:
 - Demarcation and analysis of the empirical background to the problem
 - Development of an operationalization of a relevant and researchable research problem/project objective, using theory taught on this semester, but usually going beyond that.
 - Development of an adequate research/project design, including the elements mentioned next
- Write a well-structured project report, written with clear arguments including the following elements:
 - A critically exploration of the empirical problem and account for the choice of theories and approaches analyze and solve the problem under investigation,
 - Detailed questions/objectives
 - An account of the data collection and data validation methods, data sources
 - An account of the analytical methods used and methods used to validate the findings
 - An account of the (design) methods used to develop recommendations/solutions to resolve the research problem / achieve the project objective.
 - Presentation and validation of data
 - Presentation, validation and discussion of analytical findings
 - Presentation and validation of recommendations/solutions
 - Evaluation of the findings and recommendations/solutions, methods and, if relevant, considerations regarding the limitations and generalizability of the study.

Competencies

- Operationalize theoretical contributions on organization/enterprise analysis, design and engineering, operations strategy and development as well as other relevant scientific fields in a practical setting
- Work together as a team to analyze and develop integrated and feasible solution(s) to a practical organizational problem

- Work together with an organization in an academically yet practically adequate manner.

Type of instruction: The module is carried out as group-based, problem-oriented project work. The group work is carried out as an independent work process in which the students themselves organize and coordinate their workload in collaboration with a supervisor. The project is carried out in groups with normally no more than 6 members.

Exam format: Oral examination based on a written report.

Evaluation criteria: Are stated in the Joint programme regulations.

3.3 2nd semester

3.3.1 Innovation and Change Management (5 ECTS)

Title: Innovation and Change Management / Innovations- og forandringsledelse

Prerequisites This module is based on knowledge gained on the 1st semester of the Operations and Innovation Management programme. As the focus of this course is on implementation, through innovation and change, profound knowledge, skills and competencies on developing integrated solutions and underlying theories are required

Objective: Upon completion of the module, the student can:

Knowledge

- Understand the role of technology, and various forms of innovation and change (including incremental/radical, business process redesign/continuous improvement, product/process/position/paradigm, business model) in established and emerging businesses
- Understand the characteristics and drivers of innovation and change, as well as the practical means of handling them in a business context
- Understand the range, scope and complexity of challenges related to the management of technology, innovation and change
- Understand organizing for and management/leadership of innovation and change, including aspects of culture, power and politics, enablers of and barriers to change, factors of innovation success and failure

Skills

- Describe, analyze and redesign innovation and change management processes
- Identify and analyze the field of innovation and change management including the value position of stakeholders; customers, suppliers and other network partners
- Design, evaluate and audit the innovative and change capabilities of a business organization
- Apply principles of business model innovation and risk management to suggest redesign and improvement of business models

Competencies

- Realize and implement innovation- and change management initiatives, including the design, implementation and execution (management/leadership) of innovation and change management projects in companies, supply chains and networks, as well as relating practical innovation and change management experiences to conceptual understanding of innovation leadership and change management

Type of instruction: The teaching is organized in accordance with the general forms of teaching, see chapter 3.

Exam format: Oral/written examination (for further information, please see the programme's study guide).

Evaluation criteria: Are stated in the Joint programme regulations.

3.3.2 Global Business Performance (5 ECTS)

Title: Global Business Performance / Præstationsmåling og -vurdering af globale forretningsprocesser

Prerequisites This module is based on knowledge gained on the 1st semester of the Operations and Innovation programme.

Objective: Upon completion of the module, the student can:

Knowledge

- Understand various perspectives and theories that inform the formation and functioning of contemporary extended enterprise which consist of the focal company and its suppliers
- Understand complexity management principles and tool kits based on systems science and systems methodology
- Account for various orientations of companies' operations systems (technology, innovation, cost, quality, flexibility) and can explain how these orientations affect performance management and control
- Understand risk types (both internal and external) and their impacts in extended enterprises
- Understand the principles of value stream costing, using value stream mapping and business process re-engineering
- Understand and can explain value engineering, target costing and chained target costing in cooperation between the focal company and its 1st, 2nd, etc. tier suppliers
- Understand total cost of ownership (TCO), differentiated on the basis of product-/supplier type, techniques in the form of 'Monetary-based method' (Activity Based Cost Systems), 'Cost-ratio/value-based method' and 'Mathematical programming decision model'
- Understand and can explain supply chains financial and non-financial performance and its sensitivity as a function of the market and selected divide between push and pull operations
- Understand and can explain conflicting and colliding cases of Lean and the company's financial management and reporting, as well as possible solutions, including financial reporting that complies with Lean's seven waste categories

Skills

- Conduct analysis and evaluation of operations performance in the context of extended enterprises
- Use tools and techniques for measuring and managing performance of activities that cross both geographical and organizational boundaries
- Initiate performance improvement programs and their implementation in contemporary extended enterprises

Competencies

- Identify and diagnose problems with performance management systems in contemporary extended enterprises
- Conceive appropriate performance management system designs
- Take responsibility for implementation and control of operations performance management systems in contemporary extended enterprises

Type of instruction: The teaching is organized in accordance with the general forms of teaching, see chapter 3.

Exam format: Written/oral examination (for further information, please see the programme's study guide).

Evaluation criteria: Are stated in the Joint programme regulations.

3.3.3 Business Intelligence and Analytics (5 ECTS)

Title: Business Intelligence and Analytics / Business Intelligence og analytiske metoder

Prerequisites: This module is based on knowledge gained on the 1st semester of the Operations and Innovation programme.

Objective: Upon completion of the module, the student can:

Knowledge

- Account for Business Intelligence (BI) concepts, theories and methods including:
 - Creation of knowledge from either people/employees/"experts" or from analysing existing data
 - Knowledge representation
 - Traditional BI handling systems such as expert systems, knowledge base systems, decision support systems and executive information systems.

Skills

- Make decisions about the optimal use of the BI concepts, theories, methods and selected systems for identification of needs, development of alternative solutions, evaluation selection and implementation
- Use BI in disciplines such as enterprise engineering/modelling, business analytics, data mining, etc.

Competences

- Apply knowledge and skills in relation to business intelligence development projects and thereby apply the knowledge handling activities: knowledge acquisition, knowledge verification, knowledge representation and knowledge engineering.

Type of instruction: The teaching is organized in accordance with the general forms of teaching, see chapter 3. Form of examination: Oral/written examination (for further information, please see the programme's study guide).

Exam format: Written/oral examination (for further information, please see the programme's study guide).

Evaluation criteria: As stated in the Joint programme regulations.

3.3.4 Global Implementation (15 ECTS)

Title: Global Implementation / Global implementing

Prerequisites This module is based on knowledge gained on the 1st semester of the Operations and Innovation Management programme, and have profound understanding of and skills and competencies in developing integrated solutions. Furthermore, this project builds on the three courses taught in the 2nd semester of the programme.

Objective: Upon completion of the module, the student can:

Knowledge

- Demonstrate understanding of the theories, concepts, methods and tools taught in this semester.

Skills

- Demonstrate the skills to choose among and apply in practice the theories, concepts, methods and tools taught in this semester.
- Analyze, and develop an integrated solution to a practical problem, usually in the form of a project developed in and together with an organization. The project theme is global implementation, and normally requires:
 - Demarcation and analysis of the empirical background to the problem
 - Development and operationalisation of a relevant and researchable research problem/project objective using theory taught on the semester, but usually going beyond that
 - Development of an adequate research/project design, including:
 - Detailed questions/objectives
 - An account of the data collection and data validation methods, data sources
 - An account of the analytical methods used and methods used to validate the findings
 - An account of the (design) methods used to develop recommendations/solutions to resolve the research problem / achieve the project objective.
 - Presentation and validation of data
 - Presentation, validation and discussion of analytical findings
 - Presentation and validation of recommendations/solutions
 - Evaluation of the findings and recommendations/solutions, methods and, if relevant, considerations regarding the limitations and generalizability of the study.

Competencies

- Work together as a team to analyze, and develop integrated and feasible solution(s) to a practical organisational problem
- Work together with an organization in an academically yet practically adequate manner.

Type of instruction: The module is carried out as group-based, problem-oriented project work. The group work is carried out as an independent work process in which the students themselves organise and coordinate their workload in collaboration with a supervisor. The project is carried out in groups with normally no more than 6 members.

Exam format: Oral examination based on a written report.

Evaluation criteria: Are stated in the Joint programme regulations.

3.4 3rd semester

3.4.1 Operations and Innovation Management (30 ECTS)

Title: Operations and Innovation Management / Værdikæder og innovationsledelse

Prerequisites: This module is based on knowledge gained on the 1st and 2nd semester of the MSc in Operations and Innovation Management programme.

Justification: The 3rd semester can take different forms:

- A traditional semester, that is, a combination of courses and a project. Course activity is evaluated and tested in accordance with the curriculum in which the course module is described.
- Academic Internship. Concurrent to the work in the company, the student makes a report which is evaluated after ending the internship.

Objective: Upon completion of the module (project or academic internship), the student can:

Knowledge

- Deep knowledge of the subject matter in the specific area of the project

Skills

- Solve complex business problems using operation and innovation management theory and concepts and management engineering methods and tools
- Evaluate and choose among potentially relevant theories, concepts and methodologies applied in the analysis and solution design of a practical business engineering problem
- Evaluate the relevance and limitations of the theories, concepts, methods and tools actually applied in the project
- Account for any choices made during the problem analysis and solution development
- Develop solution alternatives and evaluate the performance, strategic, organizational, managerial and other relevant prerequisites for and consequences of solution alternatives and make a well-informed choice based on that
- Plan, execute and report an extensive individual research project within an agreed time frame
- Write a well-structured project report, which meets all the usual requirements of an academic work, including:
 - Empirical background
 - Research problem/project objective
 - Relevant theory
 - Research design:
 - Detailed questions/objectives
 - An account of the data collection and data validation methods, data sources
 - An account of the analytical methods used and methods used to validate the findings.
 - An account of the methods used to develop recommendations/solutions to resolve the research problem/achieve the project objective

- Presentation and validation of data
- Presentation, validation and discussion of analytical findings
- Presentation and validation of recommendations/solutions
- Evaluation of the project; i.e., findings, methods and, if relevant, considerations regarding the limitations and generalizability of the study.
- specific for internship: a personal reflection is required, a reflection on: how was it to work alone, full-time in a company, and, if applicable, in a different country with a different culture, language, industrial structure, etc.

Competences

- Analyze and solve an actual problem of industrial relevance through application of systematic research and development processes, including advanced analytical, experimental, and/or numerical methods and models.
- Work together with a manufacturing or service organization and identify operations and/or innovation management problems and finally develop data driven and robust solutions using technologies.
- Operationalize theoretical contributions in a practical setting
- Compare and critically evaluate the results of the project in relation to existing knowledge and accepted theories within the subject area
- Consider economic and other consequences of the proposed solutions
- Communicate a balanced view of the results and conclusions of the project in well-organized written and oral presentation

Organization:	Dependent on student's choice of content and organization of the semester; the student may choose between project work at Aalborg University or a voluntary traineeship at a company in Denmark or abroad. The total work load of the semester has to be equivalent to 30 ECTS. If carried out at Aalborg University, the project may be finalized with a project report or in the form of a scientific paper. If continued at the 4th semester, the project is evaluated with a midterm evaluation. For further information about the organisation of the module please see the Joint programme regulations, chapter 2.3 .
Exam Format:	Oral examination based on a written report (for further information, please see the programme's study guide).
Evaluation criteria:	As stated in the Joint programme regulations.

3.5 4th semester

3.5.1 Master's Thesis (30 ECTS)

Title:	Master's Thesis / Kandidatspeciale
Prerequisites:	Successful conclusion of the first three semesters of the Operations and Innovation Management programme. Exemptions to this rule may be given, but only by decision of the Study Board of Industry and Global Business Development.
Goal:	Upon completion of the project the student can:

Knowledge

- Deep knowledge of the subject matter in the specific area of the project

Skills

- Plan, execute and report an extensive individual research project within an agreed time frame
- Apply scientific methodology in solving a wide variety of problems within the field of specialisation
- Perform scientific work in relevant topics of the field of the specialisation
- Apply a wide range of technologies and engineering methods in research and development projects in the field of specialization
- Write a well-structured project report, written with clear arguments including the following elements:
 - Develop and delimit an original formulation of the problem being investigated,
 - Critically explore and apply relevant theories and analytical approaches to the problem under investigation,
 - Assemble and process valid and reliable data, relevant to the problem and sub-problems under scrutiny,
 - Make a thorough, systematic, and comprehensive analysis of the problem under investigation
- Participate in or lead projects within the fields of the specialisation.

Competences

- Plan, execute and report an extensive individual research project within an agreed time frame
- Conduct technological development and research, and solve complicated technical problems using scientific methods
- Work independently with a project on a complex problem within their field of interest on the highest possible level within their specialisation
- Take part in both discipline-specific and interdisciplinary cooperation to solved complex problems

- Compare and critically evaluate the results of the project in relation to existing knowledge and accepted theories within the subject area
- Consider economic consequences and impact on society, environmental and safety issues related to the project
- Communicate a balanced view of the results and conclusions of the project in well-organized written and oral presentation

Teaching Method: In this module, the Master's Thesis is carried out. The module constitutes independent project work and concludes the programme. Within the approved topic, the Master's Thesis must document that the level of the programme has been attained.

Form of examination: Oral examination with participation of an external examiner.

Evaluation criteria: As stated in the Joint programme regulations.

Chapter 4: Entry into Force, Interim Provisions and Revision

The curriculum is approved by the Dean of the Faculty of Engineering and Science and enters into force as of September 2016.

Students who wish to complete their studies under the previous curriculum from 2015 must conclude their education by the summer examination period 2017 at the latest, since examinations under the previous curriculum are not offered after this time.

In accordance with the Joint programme regulations for the Faculty of Engineering and Science at Aalborg University, the curriculum must be revised no later than five years after its entry into force.

Chapter 5: Other Provisions

5.1 Rules concerning Written Work, including the Master's Thesis

In the assessment of all written work, regardless of the language in which it is written, weight is also put on the student's spelling and formulation ability, in addition to the academic content. Orthographic and grammatical correctness as well as stylistic proficiency are considered basis for the evaluation of language performance. Language performance must always be included as an independent dimension of the total evaluation. However, no examination may be assessed as 'Pass' on the basis of language performance alone; similarly, an examination cannot normally be assessed as 'Fail' on the basis of poor language performance alone.

The Board of Studies can grant exemption from this in special cases (e.g., dyslexia or a native language other than Danish).

The Master's Thesis must include an English summary.³ If it is written in English, the summary must be in Danish.⁴ The summary must be at least one page and maximum two pages. The summary is included in the evaluation of the project as a whole.

5.2 Rules concerning Credit Transfer (merit), including the Possibility for Choice of Modules that are Part of another Programme at a University in Denmark or Abroad

In the individual case, the Board of Studies can approve successfully completed (passed) programme elements from other Master programmes in lieu of programme elements in this programme (credit transfer). Decisions on credit transfer are made by the Board of Studies based on an academic assessment. See the Joint programme regulations for the rules on credit transfer.

³ Or another foreign language (upon approval from the Board of Studies).

⁴ The Board of Studies can grant exemption from this.

5.3 Rules for Examinations

The rules for examinations are stated in the Examination Policies and Procedures published by the Faculty of Engineering and Science on their website.

5.4 Exemption

In exceptional circumstances, the Board of Studies study can grant exemption from those parts of the curriculum that are not stipulated by law or ministerial order. Exemption regarding an examination applies to the immediate examination.

5.5 Additional Information

The current version of the curriculum is published on the Board of Studies' website, including more detailed information about the programme and exams.

5.6 Completion of the Master Programme

The Master's programme must be completed no later than four years after it was begun.

5.7 Rules and Requirements concerning the Reading of Texts in Foreign Languages and a Statement of the Foreign Language Knowledge this Assumes

It is assumed that the student is able to read academic texts in modern English and use reference works, etc., in other European languages.