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

Specialisations in Global Business Development (Aalborg) and Global Management (Copenhagen)

Aalborg University 2014

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Preface

Pursuant to Act 367 of May 22, 2013 on Universities (the University Act) with subsequent changes, the following curriculum for the Master's program in Operations and Innovation Management is stipulated. The program also follows the Framework Provisions and the Examination Policies and Procedures for the Faculties of Engineering, Science and Medicine. The specialisation in Global Business Development is taught at Aalborg Campus and the specialisation in Global Management is taught at Copenhagen Campus.

Contents

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, Technology and Innovation's Ministerial Order no. 814 of June 29, 2010 on Bachelor's and Master's Programmes at Universities (the Ministerial Order of the Study Programmes) and Ministerial Order no. 857 of July 1, 2010 on University Examinations (the Examination Order) with subsequent changes. Further reference is made to Ministerial Order no. 233 of March 24, 2011 (the Admission Order) and Ministerial Order no. 250 of March 15, 2007 (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.

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

2.1 Admission

Admission to the Master's programme in Operations and Innovation Management requires a Bachelor degree in Manufacturing and Operations Engineering (AAU) (retskrav), Global Business Engineering (AAU) (retskrav), Diplomingeniør – Eksportteknologi (AAU), Diplomingeniør – Industri og Produktion (AAU), Diplomingeniør – Eksport (IHK), Diplomingeniør - Global Business Development (VIA), or the like.

2.2 Degree Designation in Danish and English

Students completing the specialisation in global business development are entitled to the Danish designation civilingeniør, cand.polyt. i værdikæder og innovationsledelse med specialisering i global forretningsudvikling. The English designation is: Master of Science (MSc) in Engineering (Operations and Innovation Management with specialisation in Global Business Development).

Students completing the specialisation in global management are entitled to the Danish designation civilingeniør, cand.polyt. i værdikæder og innovationsledelse med specialisering i global ledelse. The English designation is: Master of Science (MSc) in Engineering (Operations and Innovation Management with specialisation in Global 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 programmes 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:

2.5.1. Competence profile of the Global Business Development specialisation

Individuals who attain a MSc in Operations and Innovation Management with specialisation in Global Business Development

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.

2.5.2. Competence profile of the Global Management specialisation

Individuals who attain a MSc in Operations and Innovation Management with specialisation in Global Management

Knowledge

- Have knowledge (based on the highest level of international research) within the domain of management engineering in the global organization in selected areas such as
    - Technology development and deployment in global supply and value chains
    - Systems and process design and engineering in global supply and value chains
    - Use of technologies for the control and management of supply and value chains
    - Organizational design and development
    - Innovation, implementation and change management from an engineering perspective
- Understand the principles of the above-mentioned areas, can reflect upon their knowledge in these areas at a scientific level, and use their knowledge to identify problems and solutions using technology and an engineering approach as central means for this.

Skills

- Excel in Analysing Complex Business Problems and Designing New Innovative Business systems and solutions by applying scientific methods and tools and general skills related to problem solving and systems design using technologies and an engineering approach within the domain of Global Operations and Innovation Management
- Are able to evaluate and select among scientific theories, methods, tools and general skills used for the conception, design, implementation and operation of global value chains, supply chains and business systems and participate in the development and implementation of novel and innovative technology-based concepts, systems and solutions
- Can apply theories, methods and concepts in different organizational and empirical settings in order to solve complicated technical problems in a societal context
- Can communicate research-based knowledge and discuss professional and scientific problems within the domain of global management with both peers and non-specialists.

Competencies

- Can manage work and development in complex and unpredictable situations requiring new solutions
- Can independently initiate and implement discipline-specific and interdisciplinary cooperation and assume professional responsibility within the area of global 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.

3.1 Overview of the programme in Global Business Development

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	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

3.2 Overview of the programme in Global Management.

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
1st		Supply Chain Configuration	5	7-point scale	Internal
		Researching Business Systems	5	7-point scale	Internal
		Operation, Innovation and Organizational Configuration	5	7-point scale	Internal
		Operations management and supply chain configuration – an integrative approach	15	7-point scale	External
2nd		Supply Chain Technologies	5	7-point scale	Internal
		Operations, Innovation and Organizational Improvement: Implementation Models and Tools	5	7-point scale	Internal
		Management Systems	5	7-point scale	Internal
		Integrating operations management and supply chain methods	15	7-point scale	Internal
3rd	A	Operations and Supply Chain Management[3]	30	7-point scale	Internal
	B	Academic Internship[4]	30	7-point scale	Internal
4th		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] 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 3.8.1
[4] See 3.8.1.

3.3 Global Business Development 1st semester

3.3.1 Organisation Analysis and Design (5 ECTS)

Title: Organisation Analysis and Design / Organisationsanalyse og design

Prerequisites: The student must meet the admission requirements described in chapter 2.1.

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 course consists of a range of highly interactive, student and faculty driven workshops which constitute a mixture of lectures, discussions, exercises and case work (see chapter 3).
Exam format:	Oral/written examination (for further information, please see the programme's study guide).
Evaluation criteria:	Are stated in the Framework Provisions.

3.3.2 Enterprise Engineering and Design (5 ECTS)

Title: Enterprise Engineering and Design / Virksomhedsudvikling

Prerequisites: The student must meet the requirements described in chapter 2.1.

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:

Knowledge

- 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.

Skills

- 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.

Competencies

- Conceive and communicate complex solutions.
- Analyse and reflect on own practice and approaches
- Assess the need for synthesizing new knowledge

Type of instruction: The module is carried out via lectures, discussions and case work (see chapter 3).

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

Evaluation criteria: Are stated in the Framework Provisions.

3.3.3 Operations Development and Strategy (5 ECTS)

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

Prerequisites: The student must meet the admission requirements described in chapter 2.1.

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 learning objectives are realised via lectures, discussions and case work (see chapter 3).

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

Evaluation criteria: Are stated in the Framework Provisions.

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

Title:	Integrated Solutions - Designing Global Business Systems and Value Chains / Integrerede løsninger - Design af globale forretningssystemer og værdikæder
Prerequisites:	The student must meet the admission requirements described in chapter 2.1.
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 Framework Provisions.

3.4 Global Business Development 2nd semester

3.4.1 Innovation and Change Management (5 ECTS)

Title:	Innovation and Change Management / Innovations- og forandringsledelse
Prerequisites	The student must have followed the 1st semester of the Operations and Innovation Management with specialization in Global Business Development programme or similar. 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 module is carried out via lectures, discussions and cases (see chapter 3).
Exam format:	Oral/written examination (for further information, please see the programme's study guide).

Evaluation criteria: Are stated in the Framework Provisions.

3.4.2 Global Business Performance (5 ECTS)

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

Prerequisites: The student must have followed the 1st semester of the Operations and Innovation Management with specialisation in Global Business Development programme or the like.

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 module is carried out via lectures and intensive seminar-based discussions involving active student participation (see chapter 3).

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

Evaluation criteria: Are stated in the Framework Provisions.

3.4.3 Business Intelligence (5 ECTS)

Title: Business Intelligence / Business Intelligence

Prerequisites: The student must have followed the 1st semester of the Operations and Innovation Management with specialisation in Global Business Development programme or equivalent.

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.

Teaching Method: The course consists of a number of lectures as well as the student's independent learning effort. The form and extent of the course is determined and described in connection with planning semester. The lesson plans, literature etc. are created in connection with this. The course is conducted as a combination of single disciplinarian, problem-oriented and cross-disciplinary fields of study and structured from a work and evaluation form which combines skills and reflection:

Lectures, Class work, Project work, Workshops, Exercises (alone and in groups), Teacher feedback, Reflection on content, Portfolio work.

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

Evaluation criteria: As stated in the Framework Provisions.

3.4.4 Global Implementation (15 ECTS)

Title: Global Implementation / Global implementering

Prerequisites: The student must have completed the 1st semester of the Operations and Innovation Management with specialization in Global Business Development programme or similar, 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 that 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 Framework Provisions.

3.5 Global Business Development 3rd semester

3.5.1 Operations and Innovation Management (30 ECTS)

Title: Operations and Innovation Management / Værdikæder og innovationsledelse

Prerequisites: 1st and 2nd semester of the MSc in Operations and Innovation Management with specialization in Global Business Development programme or similar.

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

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 Framework Provisions.

3.6 Global Management 1st semester

3.6.1 Supply Chain Configuration

Title: Supply Chain Configuration / Konfiguration af værdikæder

Prerequisites: The student must meet the admission requirements described in chapter 2.1.

Justification: This course will address the key choices an organization has to make when conceiving and designing its supply and value chain. This course is focused on the external configuration of the organizations supply and value chain in order to achieve high levels of effectiveness.

Objectives: Upon completion of the course, the student can:

Knowledge

- Understand the common and distinguishing features of manufacturing and service supply chains
- Explain how supply chain strategy helps drive competitiveness in terms of cost efficiency, quality, delivery responsiveness, and flexibility
- Describe a supply chain strategy including location choices, outsourcing/offshoring, order to delivery choices, collaboration with supply chain partners and sustainability
- Understand the use of control and coordination technologies in manufacturing and service supply chains.
- Understand the role of various supply chain drivers and metrics

Skills

- Identify the key supply chain drivers and the role of supply chain strategy in driving firm competitiveness
- Design a supply chain strategy for manufacturing and service organizations, which achieves strategic fit with business and market requirements

Competencies

- Conceive and design a supply chain strategy which includes technological opportunities and technologies

Type of instruction: The learning objectives are realised via lectures, discussions and case work (see chapter 3).

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

Evaluation criteria: Are stated in the Framework Provisions.

3.6.2 Researching Business Systems (5 ECTS)

Title:	Researching Business Systems / Studier af forretningssystemer
Prerequisites	The student must meet the admission requirements described in chapter 2.1.
Justification	This course has focus on the methodological approaches, tools and techniques necessary for creating and analyzing data in the semester projects which are reliable and valid. Focus is both on quantitative and qualitative data.

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

Knowledge

- Understand methodological approaches and tools for studying organizations and supply and value chains
- Understand and explain of the key methodological trade-offs between different scientific methods when studying organisations and supply and value chains
- Understand the key approaches to increase the quality of data collection
- Describe different methods to analyse both quantitative and qualitative data
- Explain statistical methods and technologies for structuring and analyzing large datasets – including analytical approaches for handling “Big-Data”

Skills

- Identify and apply appropriate research methods necessary for analyzing and improving global business processes.
- Evaluate different strategies and approaches for data collection and analysis.
- Use statistical methods for data analysis

Competencies

- Select and operationalise appropriate quantitative and qualitative approaches to data collection and analysis
- Collect reliable and valid data.

Type of instruction:	The learning objectives are realised via lectures, discussions and case work (see chapter 3).
Exam format:	Internal oral/written examination (for further information, please see the programme’s study guide).
Evaluation criteria:	Are stated in the Framework Provisions.

3.6.3 Operations, Innovation and Organizational Configuration (5 ECTS)

Title: Operations, Innovation and Organizational Configuration / Konfigurering af produktion, innovation og organisation

Prerequisites: The student must meet the admission requirements described in chapter 2.1.

Justification: This course has an internal focus and is thus looking inward in the organization. This course addresses the key strategic choices an organization has to make in order to conceive and design an effective internal configuration with regard to operation and innovation. The course also acknowledges that this takes place within and organizational context which must be understood and taken into account.

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

Knowledge

- Understand key structural and infrastructural choices within the design of manufacturing and service systems
- Explain of the role of technology in design of an operations strategy
- Describe key organizational design options in connection with creating an effective organization
- Understand key strategic choices and trade-offs within operations and innovation strategy design.

Skills

- Evaluate the strategic role of operations and innovation for the value creation and competitiveness of the firm.
- Analyze the role of technologies in the operations and innovation processes within the firm and conceive ways in which technologies can be applied in these processes.
- Analyze an organizational context focusing on the alignment between the organizational configuration and key operations or innovation choices.

Competencies

- Conceive and design an operations and innovation strategy aligned with the organizational context for manufacturing and service organizations, which achieves strategic fit with business and market requirements
- Conceive and design an operations and innovation strategy which makes use of technological opportunities and technologies

Type of instruction: The learning objectives are realised via lectures, discussions and case work (see chapter 3).

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

Evaluation criteria: Are stated in the Framework Provisions.

3.6.4 Operations Management and Supply Chain Configuration – an integrative approach (15 ECTS)

Title: Operations Management and Supply Chain Configuration – an integrative approach / Konfigurering af produktionssystemer og værdikæder – en integrativ tilgang

Prerequisites: The student must meet the admission requirements described in chapter 2.1.

Justification: This project module attempt to integrate the external perspective from the course "*supply chain configuration*" with the internal perspective from the course "operations, innovation and organizational configuration" – in order to create consistent and coherent configuration of the supply and value chain of a manufacturing or service organization.

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

Knowledge

- Account for how to link selected parts of operations, innovations and supply chain strategies with the aim of developing an integrated approach to the (re)configuration of the supply chain of an manufacturing or service organization in practice.
- Understand the role for and the deployment of technologies in the organization's supply chain
- Explain how to overcome real life challenges connected to the (re)configuration of the organization's supply chain.
- Show how to operationalize theoretical contributions to practical settings.

Skills

- Combine insights from the literature on operations, innovation and supply chain strategy for designing a company's supply chain.
- Use insights from the literature to support supply chains management choices such as network configuration, degrees of integration and location methods
- Analyse the role of technologies in the organizations supply chain
- 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
- Evaluate of the findings and recommendations/solutions, methods and, if relevant, considerations regarding the limitations and generalisability of the study.

Competencies

- Operationalize theoretical contributions in a practical setting

- Work together as a team to analyse and collect data in connection to problems that require an integration of operations, innovation and supply chain strategy in a real life setting
- Work together with an organisation in connection to identifying operations and/or supply chain strategies and identify different strategic scenarios.
- Integrate considerations on the deployment of technologies into the supply chain strategy of the organization

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 Framework Provisions.

3.7 Global Management 2nd semester

3.7.1 Supply Chain Technologies (5 ECTS)

Title:	Supply Chain Technologies / Teknologier i værdikæden
Prerequisites	Supply Chain Configuration
Justification	This course focuses on the technological opportunities and solutions which is necessary to implement and operate an efficient supply or value chain for a manufacturing or service organization.
Objective:	Upon completion of the module, the student can: *Knowledge* • Account for key analytical techniques and methodologies used for developing decision support systems for supply chain (for example. econometric methods, optimization, simulation and heuristics) • Explain the role of technology enabled decision support in demand forecasting, sourcing planning, supply chain network design, capacity planning, network master planning, production planning and scheduling, inventory management, logistics planning and distribution planning • Understand the significance of analytical techniques in supply chain planning • Understand how to analyze supply chain processes and identify opportunities for improvement • Understand technology requirements and evaluate possible technology and analytical options for supply chain planning *Skills* • Map supply chain processes and identify areas for improvement. • Evaluate possible technology and analytical options for supply chain planning • Design effective technology enabled decision support systems for efficient supply chains
Type of instruction:	The module is carried out via lectures, discussions and cases (see chapter 3).
Exam format:	Oral/written examination (for further information, please see the programme's study guide).
Evaluation criteria:	Are stated in the Framework Provisions.

3.7.2 Operations, Innovation and Organizational Improvement: implementation models and tools

Title: Operations, Innovation and Organizational Improvement: implementation models and tools / Forbedring af produktion, innovation og organisation: Implementeringsmodeller og –værktøjer

Prerequisites: Operations, Innovation and Organizational Configuration

Justification: The course focuses on how process improvement can be carried out in practice. Furthermore, in continuation of this, the course also focuses on how an organization can implement new processes and systems with success and in a way which creates value for the organization and key stakeholders.

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

Knowledge:

- Account for different process improvement methodologies and techniques in order to create efficient processes in the organization
- Explain how an organization can deploy technologies in the improvement and innovation processes of the organization
- Explain how to create, manage and implement technological and organizational changes within an organization including knowledge about how to manage technological change projects within an organization.
- Understand the challenges involved in implementing technological changes in an organization taking the organizational context into consideration

Skills:

- Evaluate and assess the need for improvement in key business processes in the organization
- Design or and re-design organizational and business processes in a manufacturing or service organization.
- Analyze the multifaceted challenges in connection with implementing technological innovations and process changes in an organization
- Design and plan efficient implementation processes of technological change in manufacturing or service organisations

Competences:

- Improve existing organizational and business processes using technologies and engineering methods in an manufacturing or service organization

Type of instruction: The module is carried out via lectures, discussions and cases (see chapter 3).

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

Evaluation criteria: Are stated in the Framework Provisions.

3.7.3 Management Systems (5 ECTS)

Title: Management Systems / Ledelsessystemer

Prerequisites: Operations, Innovation and Organizational Configuration, Supply chain Configuration

Justification: The core idea in this course is to allow the students to work core business functions, processes and systems. Furthermore, the students should be able to improve these core business functions, processes and systems in a structured and systematic manner.

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

Knowledge

- Understand inter-relationships between business functions like R&D, internal operations and logistics and supply chain management
- Describe methods to assess the financial implications of decisions within core business functions
- Explain the possibilities to conduct risk management at functional and organizational level
- Understand the differences between functional and organizational performance management systems
- Account for cross-functional linkages between business functions for the efficient management in the global organization

Skills

- Identify improvement opportunities involving multiple functions in an organization and partners across the supply and value chain
- Evaluate suggestions for improvements across core business functions and across the supply and value chain in a structured and systematic manner
- Analyze the sources of risks across functions
- Configure functional and organizational performance management systems

Competencies

- Design efficient processes in logistics, supply chain, and new product development systems ensuring cross-functional integration, risk management.
- Develop a holistic performance management systems for individual functions and overall organization by understanding the impact of functional performance measures on overall corporate performance

Type of instruction: The module is carried out via lectures, discussions and cases (see chapter 3).

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

Evaluation criteria: Are stated in the Framework Provisions.

3.7.4 Integrating Operations Management and Supply Chain Methods (15 ECTS)

Title:	Integrating Operations Management and Supply Chain Methods / Integration af produktions og værdikæde metoder
Prerequisites	The student must have followed the 1st semester of the Operations and Innovation Management with specialisation in Global Management programme or the like.
Justification	The idea in this project module is for the students to work with problems related to establishing the link between operations management technologies, techniques and tools with an internal focus with external supply chain methods with the aim of developing data driven, efficiency and technology oriented solutions for a manufacturing or service organization
Objective:	Upon completion of the module, the student can:

Knowledge

- Describe how different methods and techniques can be applied in combination to increase the efficiency of the organization and its processes.
- Understand to role of technology as a key element in making organisations more efficient
- Explain how a manufacturing or service organization operations, innovation and supply chain strategy affects which tools are most applicable and/or relevant.

Skills

- Combine operations management and supply chain methods and demonstrate the solutions contribution to enhancing the efficiency of the company by applying practical tools from operations management and from the supply chain literature.
- 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
- Evaluate the findings and recommendations/solutions, methods and, if relevant, considerations regarding the limitations and generalisability of the study.

Competencies

- Work together as a team to analyse and collect data in connection to problems that require an integration of operations management and supply chain management in practice
- Work together with a manufacturing or service organisation and to identify operations and/or supply chain management problems and finally develop data driven and robust solutions using technologies.
- Operationalize theoretical contributions in a practical setting

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 Framework Provisions.

3.8 Global Management 3rd semester

3.8.1 Operations and Supply Chain Management (30 ECTS)

Title: Operations and Supply Chain Management / Produktions- og værdikædeledelse

Prerequisites: 1st and 2nd semester of the MSc in Operations and Innovation Management with specialisation in Global Management programme or the like.

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, the student can:

Knowledge

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

Skills

- Evaluate the concepts, theories and methodologies applied in the solution of the problem
- Account for the choices made during the solution of the problem and substantiate that these are made on a high professional level
- Assess and evaluate the limitations of the concepts, theories and methodologies applied in the solution of the problem.
- Plan, execute and report an extensive individual research project within an agreed time frame
- 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
- Conduct technological development and research, and solve complicated technical problems using scientific methods

Competences

- Analyse 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 organisation and to identify operations and/or supply chain 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

Form of examination: Oral examination based on a written report (for further information, please see the programme's study guide).

Evaluation criteria: As stated in the Framework Provisions.

3.9 Global Business Development & Global Management 4th semester

3.9.1 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 Framework Provisions.

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 2014.

Students who wish to complete their studies under the previous curriculum from 2012 must conclude their education by the summer examination period 2015 at the latest, since examinations under the previous curriculum are not offered after this time.

In accordance with the Framework Provisions and the Handbook on Quality Management 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.[5] If it is written in English, the summary must be in Danish.[6] 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

[5] Or another foreign language (upon approval from the Board of Studies).
[6] The Board of Studies can grant exemption from this.

transfer). Decisions on credit transfer are made by the Board of Studies based on an academic assessment. See the Framework Provisions for the rules on credit transfer.

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.