AALBORG UNIVERSITET

CIVILINGENIØR, CAND.POLYT. I VÆRDIKÆDER OG TEKNISK LEDELSE 2017

CIVILINGENIØR
KØBENHAVN

MODULER SOM INDGÅR I STUDIEORDNINGEN

INDHOLDSFORTEGNELSE

SUPPLY CHAIN CONFIGURATION

2019/2020

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

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

COMPETENCES

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

TYPE OF INSTRUCTION

The teaching is organized in accordance with the general form of teaching. Please see the programme cirruculum §17.

EXTENT AND EXPECTED WORKLOAD

Since it is a 5 ECTS course module the expected workload is 150 hours for the student.

EXAM

EXAMS

Name of exam	Supply Chain Configuration
Type of exam	Written or oral exam
ECTS	5
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Konfiguration af værdikæder
Module code	M-OME-K1-1

Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Location of the lecture	Campus Copenhagen
Responsible for the module	Atanu Chaudhuri

ORGANISATION

Study Board	Study Board of Mechanical Engineering and Physics
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

RESEARCHING BUSINESS SYSTEMS

2019/2020

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

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

COMPETENCES

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

TYPE OF INSTRUCTION

The teaching is organized in accordance with the general form of teaching. Please see the programme cirruculum §17.

EXTENT AND EXPECTED WORKLOAD

Since it is a 5 ECTS course module the expected workload is 150 hours for the student.

EXAM

EXAMS

Name of exam	Researching Business Systems
Type of exam	Written or oral exam
ECTS	5
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Studier af forretningssystemer

Module code	M-OME-K1-2
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Copenhagen
Responsible for the module	Ole Henning Sørensen

ORGANISATION

Study Board	Study Board of Mechanical Engineering and Physics
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

OPERATIONS, INNOVATION AND ORGANIZATIONAL CONFIGURATION

2019/2020

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

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.

COMPETENCES

- 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 teaching is organized in accordance with the general form of teaching. Please see the programme cirruculum §17.

EXTENT AND EXPECTED WORKLOAD

Since it is a 5 ECTS course module the expected workload is 150 hours for the student.

EXAM

EXAMS

Name of exam	Operations, Innovation and Organizational Configuration
Type of exam	Written or oral exam
ECTS	5
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Konfigurering af produktion, innovation og organisation
Module code	M-OME-K1-3
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Copenhagen
Responsible for the module	Peter Hasle

ORGANISATION

Study Board	Study Board of Mechanical Engineering and Physics
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

OPERATIONS MANAGEMENT AND SUPPLY CHAIN CONFIGURATION – AN INTEGRATIVE APPROACH

2019/2020

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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.

LEARNING OBJECTIVES

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.

COMPETENCES

- 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.

EXTENT AND EXPECTED WORKLOAD

Since it is a 15 ECTS project module the expected workload is 450 hours for the student.

EXAM

EXAMS

Name of exam	Operations Management and Supply Chain Configuration – an Integrative Approach
Type of exam	Oral exam based on a project
ECTS	15
Assessment	7-point grading scale
Type of grading	External examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Konfigurering af produktionssystemer og værdikæder – en integrativ tilgang
Module code	M-OME-K1-4
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	15
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Copenhagen
Responsible for the module	Atanu Chaudhuri

ORGANISATION

Study Board	Study Board of Production
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

SUPPLY CHAIN TECHNOLOGIES

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

This module is based on knowledge obtained in 1st Semester in Supply Chain Configuration

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

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 teaching is organized in accordance with the general form of teaching. Please see the programme cirruculum §17.

EXTENT AND EXPECTED WORKLOAD

Since it is a 5 ECTS course module the expected workload is 150 hours for the student.

EXAM

EXAMS

Name of exam	Supply Chain Technologies
Type of exam	Written or oral exam
ECTS	5
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Teknologier i værdikæden
Module code	M-OME-K2-1
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Copenhagen
Responsible for the module	Atanu Chaudhuri

ORGANISATION

Study Board	Study Board of Mechanical Engineering and Physics
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

OPERATIONS, INNOVATION AND ORGANIZATIONAL IMPROVEMENT: IMPLEMENTATION MODELS AND TOOLS

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

This module is based on knowledge obtained in 1st Semester in Operations, Innovation and Organizational Configuration

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

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 teaching is organized in accordance with the general form of teaching. Please see the programme cirruculum §17.

EXTENT AND EXPECTED WORKLOAD

Since it is a 5 ECTS course module the expected workload is 150 hours for the student.

EXAM

EXAMS

Name of exam	Operations, Innovation and Organizational Improvement: Implementation Models and Tools
Type of exam	Written or oral exam

ECTS	5
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Forbedring af produktion, innovation og organisation: Implementeringsmodeller og –værktøjer
Module code	M-OME-K2-2
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Copenhagen
Responsible for the module	Peder Veng Søberg

ORGANISATION

Study Board	Study Board of Mechanical Engineering and Physics
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

MANAGEMENT SYSTEMS

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

This module is based on knowledge obtained in 1st Semester in Operations, Innovation and Organizational Configuration and in Supply Chain Configuration.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

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

COMPETENCES

- 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 teaching is organized in accordance with the general form of teaching. Please see the programme cirruculum §17.

EXTENT AND EXPECTED WORKLOAD

Since it is a 5 ECTS course module the expected workload is 150 hours for the student.

EXAM

EXAMS

Name of exam	Management Systems
Type of exam	Written or oral exam
ECTS	5

Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Ledelsessystemer
Module code	M-OME-K2-3
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Copenhagen
Responsible for the module	Atanu Chaudhuri

ORGANISATION

Study Board	Study Board of Mechanical Engineering and Physics
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

INTEGRATING OPERATIONS MANAGEMENT AND SUPPLY CHAIN METHODS

2019/2020

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

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

LEARNING OBJECTIVES

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.

COMPETENCES

- 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.

EXTENT AND EXPECTED WORKLOAD

Since it is a 15 ECTS project module the expected workload is 450 hours for the student.

EXAM

EXAMS

Name of exam	Integrating Operations Management and Supply Chain Methods
Type of exam	Oral exam based on a project
ECTS	15
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Integration af produktions og værdikæde metoder
Module code	M-OME-K2-4
Module type	Project
Duration	1 semester
Semester	Spring
ECTS	15
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Copenhagen
Responsible for the module	Atanu Chaudhuri

ORGANISATION

Study Board	Study Board of Production
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

OPERATIONS AND SUPPLY CHAIN MANAGEMENT

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

The module adds to knowledge obtained in 1st and 2nd Semester

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

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

TYPE OF INSTRUCTION

The project 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 may be carried out individually or in groups. The project may be finalized with a project report or in the form of a scientific paper with supporting appendices.

EXTENT AND EXPECTED WORKLOAD

Since it is a 30 ECTS project module the expected workload is 900 hours for the student.

EXAM

EXAMS

Name of exam	Operations and Supply Chain Management
Type of exam	Oral exam based on a project
ECTS	30
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Produktions- og værdikædeledelse
Module code	M-OME-K3-1
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	30
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Copenhagen
Responsible for the module	Anders Paarup Nielsen

ORGANISATION

Study Board	Study Board of Production
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

ACADEMIC INTERNSHIP

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

The module adds to knowledge obtained in 1st and 2nd Semester

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

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

TYPE OF INSTRUCTION

The student is included in the company’s daily work and carry out independent project work on an industrial problem relevant for the company. Concurrent to the work in the company, the student makes a project report, which is evaluated after the ending of the internship.

EXTENT AND EXPECTED WORKLOAD

Since it is a 30 ECTS project module the expected workload is 900 hours for the student.

EXAM

EXAMS

Name of exam	Academic Internship
Type of exam	Oral exam based on a project
ECTS	30
Assessment	7-point grading scale
Type of grading	Internal examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Projektorienteret forløb i en virksomhed
Module code	M-OME-K3-2
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	30
Language of instruction	English
Location of the lecture	Campus Copenhagen
Responsible for the module	Anders Paarup Nielsen

ORGANISATION

Study Board	Study Board of Production
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

LONG MASTER'S THESIS

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

The module adds to knowledge obtained in 1st – 2nd Semester

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

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

TYPE OF INSTRUCTION

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.

EXTENT AND EXPECTED WORKLOAD

Since it is a 60 ECTS project module the expected workload is 1800 hours for the student.

EXAM

EXAMS

Name of exam	Long Master’s Thesis
Type of exam	Master's thesis/final project
ECTS	60
Assessment	7-point grading scale
Type of grading	External examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Langt Kandidatspeciale
Module code	M-OME-K3-3
Module type	Project
Duration	2 semesters
Semester	Autumn
ECTS	60
Language of instruction	English
Location of the lecture	Campus Copenhagen
Responsible for the module	Anders Paarup Nielsen

ORGANISATION

Study Board	Study Board of Production
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

MASTER'S THESIS

2019/2020

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

The module adds to knowledge obtained in 1st – 3rd Semester

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

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

TYPE OF INSTRUCTION

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.

EXTENT AND EXPECTED WORKLOAD

Since it is a 30 ECTS project module the expected workload is 900 hours for the student.

EXAM

EXAMS

Name of exam	Master’s Thesis
Type of exam	Master's thesis/final project
ECTS	30
Assessment	7-point grading scale
Type of grading	External examination
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Kandidatspeciale
Module code	M-OME-K4-1
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	30
Language of instruction	English
Location of the lecture	Campus Copenhagen
Responsible for the module	Anders Paarup Nielsen

ORGANISATION

Study Board	Study Board of Production
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science