



AALBORG UNIVERSITET

MASTER OF SCIENCE (MSC) IN ENGINEERING (MANUFACTURING TECHNOLOGY) 2017

MASTER OF SCIENCE (MSC) IN ENGINEERING
AALBORG

MODULES INCLUDED IN THE CURRICULUM

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MANUFACTURING TECHNOLOGY

2018/2019

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

- Have an understanding of the basic elements and concepts involved in the technical aspects of industrial manufacturing
- Have attained an understanding of how to analyse manufacturing systems in order to identify potential areas of improvements
- Have attained an understanding of how to select and use suitable models for improving a particular manufacturing process or manufacturing system

SKILLS

- Be able to analyse technical issues with relation to manufacturing processes and production in a production facility
- Understand the influence on a process or series of processes in a system context. Either specific (process, geometry material) or using system design theory.
- Be able to formulate operational objectives for the performance of a manufacturing process or production facility
- Be able to use existing modelling techniques to model and improve a manufacturing process and/or a manufacturing system
- Be able to validate the chosen model

COMPETENCES

- Be able to analyse any given manufacturing system and to prescribe measures to improve the efficiency of the facility
- Be able to formulate suitable models to improve either a specific manufacturing process or a manufacturing system.
- Have the ability to design and evaluate a technical solution.

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 course module the expected workload is 450 hours for the student.

EXAM

EXAMS

Name of exam	Manufacturing Technology
Type of exam	Oral exam based on a project
ECTS	15
Assessment	7-point grading scale
Type of grading	Internal examination

FACTS ABOUT THE MODULE

Danish title	Produktionsteknologi
Module code	M-MT-K1-1
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	15
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Simon Bøgh

ORGANISATION

Study Board	Study Board of Industry and Global Business Development
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

NON-LINEAR FINITE ELEMENT - APPLIED ON MATERIALS PROCESSING

2018/2019

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

- Have an understanding of how careful modelling and a profound understanding of the numerical methodology can help an engineer in producing reliable and precise simulations for a wide variety of problems
- Have knowledge of element technology, such as bar, beam, solid and shell elements
- Be able to apply nonlinear finite element methods including solution of systems of nonlinear equations, geometrically nonlinear problems, contact problems and nonlinear material models
- Have an understanding of the non-linear nature of certain manufacturing processes
- Have an understanding of material modelling:
 - Plasticity and viscoelasticity
 - Non-linear properties of engineering materials such as steel and polymers
 - Methods to obtain material characteristics.

SKILLS

- Be able to solve engineering problems using a commercial finite element programme
- Demonstrate a basic understanding of concepts, theory and applications of finite element analysis from an engineering point of view
- As every simulation is a compromise between precisions and cost, the student must be able to judge the advantages and disadvantages of the different software options available
- Be able to model certain manufacturing processes using the finite element theory
- Be able to model a material based on test results
- Be able to conduct a systematic assessment of results.

COMPETENCES

- Use finite element tools to model, simulate and interpret issues related to product and/or process design
- Be able to judge the opportunities and limitations of finite element simulations with regard to product and/or process design.

TYPE OF INSTRUCTION

The teaching is organized in accordance with the general form of teaching. Please see the programme curriculum §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	Non-linear Finite Element - Applied on Materials Processing
Type of exam	Written or oral exam
ECTS	5

Assessment	Passed/Not Passed
Type of grading	Internal examination

FACTS ABOUT THE MODULE

Danish title	Non-linear finite element – anvendt på materiale processing
Module code	M-MT-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 Aalborg
Responsible for the module	Benny Endelt

ORGANISATION

Study Board	Study Board of Industry and Global Business Development
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

TECHNOLOGY AND OPERATIONS MANAGEMENT

2018/2019

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

- Understand the fundamental principles of operations management in setups where technology is seen as an essential driver
- Have an understanding of the relationship between technology maturity and operations management
- Understand the use of comprehensive manufacturing concepts that include both mechanical and IT based elements
- Understand the assumptions and limitations of the modelling and simulation tools in the process of planning and implementing

SKILLS

- Be able to develop a requirements specification for a manufacturing system with a high degree of technological uncertainty
- Be able to develop solution concepts that include both mechanical and IT based elements
- Be able to identify critical elements of proposed solution concepts.
- Be able to use appropriate modelling and simulation tools for developing solutions
- Be able to formulate a plan for a project's implementation

COMPETENCES

- Be able to professionally participate in the development of new manufacturing systems, focusing on the evaluation, selection and implementation of relevant technologies
- Establish the foundation for applying advanced and relevant simulation tools for future research and development activities.

TYPE OF INSTRUCTION

The teaching is organized in accordance with the general form of teaching. Please see the programme curriculum §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	Technology and Operations Management
Type of exam	Written or oral exam
ECTS	5
Assessment	7-point grading scale
Type of grading	Internal examination

FACTS ABOUT THE MODULE

Danish title	Teknologi- og driftsledelse
Module code	M-MT-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 Aalborg
Responsible for the module	Poul Henrik Kyvsgaard Hansen

ORGANISATION

Study Board	Study Board of Industry and Global Business Development
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

DESIGN FOR MANUFACTURING

2018/2019

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

- Have gained an in-depth understanding of:
 - Concepts, theories and methods regarding models for disposition of specific product design features according to needs and wants from other organizational functional areas
 - Technologies and systems that can support the development of such dispositions.
- Have gained knowledge about the relationships between the knowledge elements in regards product design features and their impact on other organizational areas. Among these are financial aspects.

SKILLS

- Be able to use of the theories and methods in design of specific DFM systems
- Be able to use relevant technologies and systems in solving specific product design problems in practice
- Be able to evaluate theoretic and practical needs for DFM and to select and substantiate economical attractive solutions
- Be able to communicate such problems and solution models to other participants in development projects.

COMPETENCES

- Be able to apply knowledge and skills in relation to complex development projects
- Be able to contribute constructively and professionally in multidisciplinary projects
- Be able to identify personal needs for additional learning and an appropriate approach

TYPE OF INSTRUCTION

The teaching is organized in accordance with the general form of teaching. Please see the programme curriculum §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	Design for Manufacturing
Type of exam	Written or oral exam
ECTS	5
Assessment	7-point grading scale
Type of grading	Internal examination

FACTS ABOUT THE MODULE

Danish title	Udvikling med produktionshensyn
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Module code	M-MT-K1-4
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Karl Brian Nielsen

ORGANISATION

Study Board	Study Board of Industry and Global Business Development
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

MACHINE LEARNING

2018/2019

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The course gives a comprehensive introduction to machine learning, which is a field concerned with learning from examples and has roots in computer science, statistics and pattern recognition. The objective is realized by presenting methods and tools proven valuable and by addressing specific application problems.

LEARNING OBJECTIVES

KNOWLEDGE

- Must have knowledge about supervised learning methods including K-nearest neighbors, decision trees, linear discriminant analysis, support vector machines, and neural networks.
- Must have knowledge about unsupervised learning methods including K-means, Gaussian mixture model, hidden Markov model, EM algorithm, and principal component analysis.
- Must have knowledge about probabilistic graphical models, variational Bayesian methods, belief propagation, and mean-field approximation.
- Must have knowledge about Bayesian decision theory, bias and variance trade-off, and cross-validation.
- Must be able to understand reinforcement learning.

SKILLS

- Must be able to apply the taught methods to solve concrete engineering problems.
- Must be able to evaluate and compare the methods within a specific application problem.

COMPETENCES

- Must have competencies in analyzing a given problem and identifying appropriate machine learning methods to the problem.
- Must have competencies in understanding the strengths and weaknesses of the methods.

TYPE OF INSTRUCTION

As described in the introduction to Chapter 3.

EXAM

EXAMS

Name of exam	Machine Learning
Type of exam	Written or oral exam
ECTS	5
Assessment	Passed/Not Passed
Type of grading	Internal examination
Criteria of assessment	As stated in Joint Programme Regulations http://www.en.tech.aau.dk/education-programmes/Education+and+Programmes/

FACTS ABOUT THE MODULE

Danish title	Maskinl�ring
Module code	ESNSPAK3K2F
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Ove Kjeld Andersen

ORGANISATION

Study Board	Study Board of Electronics and IT
Department	Department of Electronic Systems
Faculty	Technical Faculty of IT and Design

DEVELOPMENT OF MANUFACTURING SYSTEMS

2018/2019

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

This module is based on knowledge gained on the 1st Semester of the MSc in the Manufacturing Technology programme.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

- Understand the fundamental principles of product design and development
- Have an understanding of the relationship between product design and manufacturing (design for manufacturing)
- Understand the use of modelling and simulation tools with regards to planning and implementing new manufacturing systems
- Understand the assumptions and limitations of the modelling and simulation tools used in a project.

SKILLS

- Be able to develop a requirements specification for a manufacturing system through an analysis of customer needs
- Be able to develop solution concepts that satisfy requirements specification
- Be able to identify critical elements of proposed solution concepts.
- Be able to use appropriate modelling and simulation tools for developing solutions
- Be able to formulate a plan for a project's continuation.

COMPETENCES

- Be able to professionally participate in the development of new products and manufacturing systems, focusing on the evaluation, selection and implementation of relevant technologies
- Establish the foundation for applying advanced and relevant simulation tools for future research and development activities.

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 course module the expected workload is 450 hours for the student.

EXAM

EXAMS

Name of exam	Development of Manufacturing Systems
Type of exam	Oral exam based on a project
ECTS	15

Assessment	7-point grading scale
Type of grading	External examination

FACTS ABOUT THE MODULE

Danish title	Udvikling af produktionssystemer
Module code	M-MT-K2-1
Module type	Project
Duration	1 semester
Semester	Spring
ECTS	15
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Simon Bøgh

ORGANISATION

Study Board	Study Board of Industry and Global Business Development
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

ROBOT VISION

2018/2019

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

This module is based on knowledge gained on the 1st Semester of the MSc in the Manufacturing Technology programme.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

- Have gained an understanding of relevant technologies enabling the design of adaptive production machines
- Have gained an understanding of machine vision and how this is integrated into robotic solutions
- Have gained an understanding of how to simulate advanced robotic solutions
- Have knowledge about the business potential of robotic vision solutions.

SKILLS

- Be able to integrate various technologies to provide manufacturing systems with intelligent capabilities (e.g. reasoning, planning, communication, perception and the ability to move and manipulate objects)
- Be able to integrate and implement machine vision into a small and limited manufacturing system.
- Be able to simulate robotic solutions.

COMPETENCES

- Be able to professionally participate in projects aiming at developing advanced robotic cells.
- Establish the foundation for applying vision and relevant simulation tools for future research and development activities.

TYPE OF INSTRUCTION

The teaching is organized in accordance with the general form of teaching. Please see the programme curriculum §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	Robot Vision
Type of exam	Written or oral exam
ECTS	5
Assessment	7-point grading scale
Type of grading	Internal examination

FACTS ABOUT THE MODULE

Danish title	Robot Vision
Module code	M-MT-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 Aalborg
Responsible for the module	Dimitrios Chrysostomos Chrysostomou

ORGANISATION

Study Board	Study Board of Industry and Global Business Development
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

ENGINEERING OPTIMIZATION – CONCEPTS, METHODS AND APPLICATIONS

2018/2019

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

The module adds to the knowledge obtained in 1st Semester.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

- Have gained an in-depth understanding of important concepts and methods of optimization for efficient solution of optimization problems within different areas of engineering, including design optimization of mechanical systems.

SKILLS

- Be able to use optimization concepts and topics.
- Be able to use numerical methods of unconstrained optimization.
- Be able to use numerical (mathematical programming) methods for optimization of multi-dimensional functions with constraints.
- Be able to solve multicriterion optimization problems.
- Be able to apply other methods of optimization, such as integer problems, response surface methods, genetic algorithms, etc.
- Be able to perform general applications of optimization methods: parameter identification, optimization as an analysis tool for problems governed by an extremum principle, surrogate and metamodelling problems.

COMPETENCES

- Be able to apply the concepts, theories and methods for solution of engineering optimization problems.
- Be able to account for the considerations involved in the process of formulating and modeling an engineering optimization problem, choosing an advantageous method of solution, and implementing it in practice.

TYPE OF INSTRUCTION

The teaching is organized in accordance with the general form of teaching. Please see the programme curriculum §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	Engineering Optimization – Concepts, Methods and Applications
Type of exam	Written or oral exam
ECTS	5
Assessment	7-point grading scale

Type of grading	Internal examination
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FACTS ABOUT THE MODULE

Danish title	Ingeniørmæssig optimering – begreber, metoder og anvendelser
Module code	M-DMS-K2-2
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Erik Lund

ORGANISATION

Study Board	Study Board of Industry and Global Business Development
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

PRODUCT DEVELOPMENT AND MODELLING

2018/2019

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

This module is based on knowledge gained on the 1st Semester of the MSc in the Manufacturing Technology programme.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

- Have an understanding of the fundamental principles of product design and development
- Have an understanding of the relationship between product design and manufacturing (design for manufacturing)
- Have an understanding of product modelling and product configuration and its implications for manufacturing

SKILLS

- Be able to use basic system theory, methods, models and approaches, including the domain theory for design of manufacturing systems
- Be able to use product modelling in support of design and as a means of integration
- Be able to use various design for X methods
- Be able to use systematic methods for specification and development of product modules and platforms

COMPETENCES

- Have the ability to systematically develop new products, in particular new manufacturing systems
- Have improved the ability to interact with product designers, enabling design for manufacturing

TYPE OF INSTRUCTION

The teaching is organized in accordance with the general form of teaching. Please see the programme curriculum §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	Product Development and Modelling
Type of exam	Written or oral exam
ECTS	5
Assessment	7-point grading scale
Type of grading	Internal examination

FACTS ABOUT THE MODULE

Danish title	Produktudvikling og -modellering
Module code	M-MT-K2-4
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Ole Madsen

ORGANISATION

Study Board	Study Board of Industry and Global Business Development
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

DIGITAL MANUFACTURING

2018/2019

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

- Have an understanding of how integrated computer-based systems can be used to develop product and manufacturing process definitions simultaneously.
- Have gained knowledge about systems and tools (e.g. modelling tools, simulation tools, 3D visualization tools, and collaboration tools) that can support this development.
- Have knowledge of how the digital information is created and distributed
- Have an in-depth understanding of the basic functionality of existing and emerging systems for digital manufacturing.
- Have an understanding of generic interfaces between systems for digital manufacturing.

SKILLS

- Be able to demonstrate a basic understanding of digital manufacturing.
- Be able to solve problems related to the simultaneous development of products and manufacturing.
- Be able to conduct a systematic assessment of the need for Digital Manufacturing.

COMPETENCES

- Use digital manufacturing tools to model, simulate and visualize issues related to the simultaneous development of products and manufacturing processes.
- Be able to judge the opportunities and limitations of Digital Manufacturing.

TYPE OF INSTRUCTION

The teaching is organized in accordance with the general form of teaching. Please see the programme curriculum §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	Digital Manufacturing
Type of exam	Written or oral exam
ECTS	5
Assessment	7-point grading scale
Type of grading	Internal examination

FACTS ABOUT THE MODULE

Danish title	Digitalt understøttet fremstilling
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Module code	M-MT-K2-5
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Empty-place Scheme	Yes
Location of the lecture	Campus Aalborg
Responsible for the module	Ole Madsen

ORGANISATION

Study Board	Study Board of Industry and Global Business Development
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

TECHNOLOGICAL INNOVATION

2018/2019

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

This module is based on knowledge gained on the 2nd Semester of the MSc in Manufacturing Technology.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

- Be able to understand and use innovation models which speed up the innovation process, reduce the risk of failure and/or improve the business or societal value
- Have an in-depth knowledge of a selected manufacturing technology.

SKILLS

- Be able to use innovation models in the solution of an industrial problem
- Be able to perform an assessment of different options to solve the problem
- Be able to explain the commercial relevance of the proposed solution
- Be able to assess the limitations of the concepts, theories and methodologies applied in the solution of the problem
- Be able to scout for new products, materials or manufacturing technologies.

COMPETENCES

- Be able to participate in technological innovation activities.

TYPE OF INSTRUCTION

The project 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 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 course module the expected workload is 900 hours for the student.

EXAM

EXAMS

Name of exam	Technological Innovation
Type of exam	Oral exam based on a project
ECTS	30
Assessment	7-point grading scale
Type of grading	Internal examination

FACTS ABOUT THE MODULE

Danish title	Teknologisk innovativ forretningskabelse
Module code	M-MT-K3-1
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	30
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Simon Bøgh

ORGANISATION

Study Board	Study Board of Industry and Global Business Development
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

ACADEMIC INTERNSHIP

2018/2019

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

This module is based on knowledge gained on the 2nd Semester of the MSc in Manufacturing Technology.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

- Be able to understand and use innovation models which speed up the innovation process, reduce the risk of failure and/or improve the business or societal value
- Have an in-depth knowledge of a selected manufacturing technology.

SKILLS

- Be able to use innovation models in the solution of an industrial problem
- Be able to perform an assessment of different options to solve the problem
- Be able to explain the commercial relevance of the proposed solution
- Be able to assess the limitations of the concepts, theories and methodologies applied in the solution of the problem
- Be able to scout for new products, materials or manufacturing technologies.

COMPETENCES

- Be able to participate in technological innovation activities.

TYPE OF INSTRUCTION

The student is included in the company's daily work. Concurrent to the work in the company, the student makes a report which is evaluated after ending the internship

EXTENT AND EXPECTED WORKLOAD

Since it is a 30 ECTS course 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

FACTS ABOUT THE MODULE

Danish title	Projektorienteret forløb i en virksomhed
Module code	M-MT-K3-2
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	30
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Simon Bøgh

ORGANISATION

Study Board	Study Board of Industry and Global Business Development
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

LONG MASTER'S THESIS

2018/2019

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

This module is based on knowledge gained on 1st – 2nd Semester of the MSc in Manufacturing Technology.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

- Be able to acquire new knowledge required to solve an industrial or scientific problem within manufacturing engineering and technology.

SKILLS

- Be able to demonstrate engineering and/or scientific skills within the line of specialisation and to display their ability to perform engineering and/or scientific work.

COMPETENCES

- Be able to work independently with a project on a specific problem within their field of interest on the highest possible level within their specialisation.

TYPE OF INSTRUCTION

In this module, the Master's project is carried out. The module constitutes independent project work and concludes the program. Within the approved topic, the Master's project must document that the level for the program 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

FACTS ABOUT THE MODULE

Danish title	Langt kandidatspeciale
Module code	M-MT-K3-3

Module type	Project
Duration	2 semesters
Semester	Autumn
ECTS	60
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Simon Bøgh

ORGANISATION

Study Board	Study Board of Industry and Global Business Development
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science

MASTER'S THESIS

2018/2019

PREREQUISITE/RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

This module is based on knowledge gained on 1st – 3rd Semester of the MSc in Manufacturing Technology.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

LEARNING OBJECTIVES

KNOWLEDGE

- Be able to acquire new knowledge required to solve an industrial or scientific problem within manufacturing engineering and technology.

SKILLS

- Be able to demonstrate engineering and/or scientific skills within the line of specialisation and to display their ability to perform engineering and/or scientific work.

COMPETENCES

- Be able to work independently with a project on a specific problem within their field of interest on the highest possible level within their specialisation.

TYPE OF INSTRUCTION

In this module, the Master's project is carried out. The module constitutes independent project work and concludes the program. Within the approved topic, the Master's project must document that the level for the program has been attained.

EXTENT AND EXPECTED WORKLOAD

Since it is a 30 ECTS course 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

ADDITIONAL INFORMATION

The master thesis can be conducted as a long master thesis using both the 3rd and 4th semester. If choosing to do a long master thesis, it has to include experimental work and has to be approved by the study board. The amount of experimental work must reflect the allotted ECTS.

FACTS ABOUT THE MODULE

Danish title	Kandidatspeciale
Module code	M-MT-K4-1
Module type	Project
Duration	1 semester
Semester	Spring
ECTS	30
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Simon Bøgh

ORGANISATION

Study Board	Study Board of Industry and Global Business Development
Department	Department of Materials and Production
Faculty	Faculty of Engineering and Science