AALBORG UNIVERSITET

CIVILINGENIØR, CAND.POLYT. I VIRKSOMHEDSTEKNOLOGI 2017

CIVILINGENIØR
AALBORG

MODULER SOM INDGÅR I STUDIEORDNINGEN

INDHOLDSFORTEGNELSE

MANUFACTURING TECHNOLOGY

2023/2024

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

Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

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	Bøgh

ORGANISATION

Education owner	Master of Science (MSc) in Engineering (Manufacturing Technology)
Study Board	Study Board of Mechanical Engineering and Physics
Department	Department of Materials and Production
Faculty	The Faculty of Engineering and Science

DEVELOPMENT OF MANUFACTURING SYSTEMS

2023/2024

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
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

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	Bøgh

ORGANISATION

Education owner	Master of Science (MSc) in Engineering (Manufacturing Technology)
Study Board	Study Board of Mechanical Engineering and Physics
Department	Department of Materials and Production
Faculty	The Faculty of Engineering and Science

TECHNOLOGICAL INNOVATION

2023/2024

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
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

FACTS ABOUT THE MODULE

Danish title	Teknologisk innovativ forretningsskabelse
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	Bøgh

ORGANISATION

Education owner	Master of Science (MSc) in Engineering (Manufacturing Technology)
Study Board	Study Board of Mechanical Engineering and Physics
Department	Department of Materials and Production
Faculty	The Faculty of Engineering and Science

ACADEMIC INTERNSHIP

2023/2024

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
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-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	Bøgh

ORGANISATION

Education owner	Master of Science (MSc) in Engineering (Manufacturing Technology)
Study Board	Study Board of Mechanical Engineering and Physics
Department	Department of Materials and Production
Faculty	The Faculty of Engineering and Science

LONG MASTER'S THESIS

2023/2024

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
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-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	Bøgh

ORGANISATION

Education owner	Master of Science (MSc) in Engineering (Manufacturing Technology)
Study Board	Study Board of Mechanical Engineering and Physics
Department	Department of Materials and Production
Faculty	The Faculty of Engineering and Science

MASTER'S THESIS

2023/2024

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
Criteria of assessment	The criteria of assessment are stated in the Examination Policies and Procedures

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	Bøgh

ORGANISATION

Education owner	Master of Science (MSc) in Engineering (Manufacturing Technology)
Study Board	Study Board of Mechanical Engineering and Physics
Department	Department of Materials and Production
Faculty	The Faculty of Engineering and Science