AALBORG UNIVERSITET

STUDIEORDNING FOR KANDIDATUDDANNELSEN (CAND.TECH.) I INDUSTRIELT DESIGN, 2020

CAND.TECH.
AALBORG

MODULER SOM INDGÅR I STUDIEORDNINGEN

INDHOLDSFORTEGNELSE

ADVANCED INTEGRATED DESIGN I: PRE-PHASE

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim is to familiarise students working professionally with the theories, tools and methods required for the pre-product development phase in which the focus is on “what to design” and “why” in terms of specifying both product, context and use of product and target group. This also includes the business modelling, product market positioning, value proposition, mission and vision for the product and the relation to the client company’s brand and market position.

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module:

- Must be able to account for and reflect upon methods and models used for analysing the internal and external factors, which constitute a company’s business context, and account for the type of knowledge which derives usable in a product specification
- Must be able to account for and evaluate a range of market, user and trend-oriented methods and theories for defining the value base and business proposition of a given design concept

SKILLS

Students who complete the module:

- Must be able to select and apply methods to analyse a company’s market position, product portfolio, competition as well as core competences and strategic strengths
- Must be able to select and apply market, user and trend-based methods and processes for identifying potential new markets – on the basis of which a new product concept can be developed
- Must be able to rapidly conceptualise and roughly sketch a product on the basis of a set of defined values, including the principles which lie behind its aesthetic expression, use and construction

COMPETENCES

Students who complete the module:

- Must be able to independently plan and carry out a pre-phase design process including internal and external business analysis, leading to a strategic market position, and the development of a value proposition towards the end-user/customer and a conceptual/principle design

TYPE OF INSTRUCTION

Types of instruction are listed in § 17; Structure and contents of the programme.

EXAM

EXAMS

Name of exam	Advanced Integrated Design I: Pre-phase
Type of exam	Written or oral exam
ECTS	5
Permitted aids	Without aids
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	Udvidet integreret design I: præ-fasen
Module code	AODIM1K201
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Jaeger, Hartmann

ORGANISATION

Study Board	Study Board of Architecture and Design
Department	Department of Architecture, Design and Media Technology
Faculty	The Technical Faculty of IT and Design

PRODUCTION AND ECONOMY

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim is to enable the students to acquire an understanding of how product features and product structure will determine the possibilities and limitations in the whole product lifecycle. This includes cost and adaptability related to production, sales, installation, service, and recycling.

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module:

- Must have knowledge of the cost and effort involved in various ways of constructing, assembling and manufacturing products and product components
- Must have knowledge of the relationship between a given product structure and the limitations and possibilities in different lifecycle situations
- Must be able to demonstrate knowledge of central theories and methods used in product families and product platforms
- Must have knowledge of the theories and methods of project management and of the financial aspects of product development (e.g. budgeting)
- Must have knowledge of basic technology and market scanning tools, basic methods for carrying out trend and competitor analysis and of the market-specific relation between cost of production and retail price point

SKILLS

Students who complete the module:

- Must be able to give a rough estimation of production costs of a given product
- Must be able to decide, argue and explain in detail the relationship between the design of the proposed method of construction, assembly and production and its market potential and price point and subsequently account for the implications for these of any changes in design

COMPETENCES

Students who complete the module:

- Must be able to argue for the relationship between retail price and expected sales (in units) of a given product and from this specify the maximum acceptable production costs
- Must be able to design and construct a simple product within a given price point using specified materials, production methods/processes and assembly methods

TYPE OF INSTRUCTION

Types of instruction are listed in § 17; Structure and contents of the programme.

EXAM

EXAMS

Name of exam	Production and Economy
Type of exam	Written or oral exam

ECTS	5
Assessment	Passed/Not Passed
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	Produktion og økonomi
Module code	M-AODIM1K202
Module type	Course
Duration	1 semester
Semester	Autumn
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Jaeger, Hartmann

ORGANISATION

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

BUSINESS DRIVEN INNOVATION BY DESIGN

2023/2024

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of the project is to enable the students to work professionally in a collaborative engineering-based design and product development process with a company or organization to achieve a professional design proposal in coherence with targets and criteria, encompassing both market and user context as well as manufacturing and production context.

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module:

- Must be able to account for and reflect on the scientific validity of the main experiments, tests, proposals and evaluations affecting the decision-making in the design process
- Must be able to explain and argue for production methods and manufacturing tools in relation to the manufacturer's market position, culture and capabilities and the environmental impact
- Must be able to account for the main critical issues in the design proposal related to market and production feasibility and the appropriate course of action to amend these

SKILLS

Students who complete the module:

- Must be able to identify, generate and communicate relevant product development research of use, market, production and technology and use this to create a design brief stating the objectives of the design proposal and generate visions and specifications and continuously revise this during the development process
- Must be able to estimate market potential, retail price point and determine the target cost of production per unit and design and construct product and product component proposals related to this price point, with due consideration to available production methods, manufacturing tools and capacity and environmental impact
- Must be able to research, explain and evaluate a main technology used in the product design or manufacturing process in the project
- Must be able to manage the design process, especially apply and argue the choice of design and construction methods used to generate proposals depending on the specific focus at a given time throughout the design process

COMPETENCES

Students who complete the module:

- Must be able to generate and present an innovative product solution for a given company, market and target group, that integrates design, construction and production aspects at an advanced level and demonstrate the ability to select, assess and further develop critical aspects of the proposed solution

TYPE OF INSTRUCTION

Types of instruction are listed in § 17; Structure and contents of the programme.

EXAM

EXAMS

Name of exam	Business Driven Innovation by Design
Type of exam	Oral exam based on a project
ECTS	20
Permitted aids	Without aids
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	Forretningsdreven innovation gennem design
Module code	AODIM1P203
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	20
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Jaeger, Hartmann

ORGANISATION

Study Board	Study Board of Architecture and Design
Department	Department of Architecture, Design and Media Technology
Faculty	The Technical Faculty of IT and Design

ADVANCED INTEGRATED DESIGN II: BUSINESS DEVELOPMENT

2023/2024

RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

The module adds to knowledge, skills and competencies obtained during 1st semester in Industrial Design Engineering at Architecture & Design or similar.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim is to enable the students to acquire an understanding of how design engineering can be used strategically and as a tool for creating new business concept. By introducing and practicing other theoretical perspectives on innovation and product development, the students will gain a greater theoretical understanding and perspective on the design approach to value creation.

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module:

- Must be able to account for theories of innovation, business models and strategic design and reflect on the role of design and its possibilities within the development of new business and their practical application
- Must be able to account for the feasibility and approximate cost of the proposed solution
- Must be able to explain, evaluate and reflect on the main differences and similarities between design engineering approach and business-related approaches to value creation and innovation.

SKILLS

Students who complete the module:

- Must be able to use and argue specific techniques and methods for innovation and entrepreneurship and apply these to opportunity identification and problem solving in relation to the choice of innovation focus
- Must be able to present a product-based business concept and adapt communication style and content to different stakeholders
- Must be able to apply knowledge on production costs and possibilities, advanced technology and manufacturing possibilities to support a business case

COMPETENCES

Students who complete the module:

- Must be able to use and implement business, entrepreneurship and/or innovation theory as an integrated part of developing ideas and designing concepts, services or product proposals
- Must be able to scientifically describe and reflect on a product development process involving innovation and entrepreneurship

TYPE OF INSTRUCTION

Types of instruction are listed in § 17; Structure and contents of the programme.

EXAM

EXAMS

Name of exam	Advanced Integrated Design II: Business Development
Type of exam	Written or oral exam
ECTS	5
Permitted aids	Without aids
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	Udvidet integreret design II: Forretningsudvikling
Module code	AODIM2K201
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Jaeger, Hartmann

ORGANISATION

Study Board	Study Board of Architecture and Design
Department	Department of Architecture, Design and Media Technology
Faculty	The Technical Faculty of IT and Design

TECHNOLOGY & FORM

2023/2024

RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

The module adds to knowledge, skills and competencies obtained during 1st semester in Industrial Design Engineering at Architecture & Design or similar.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of this course is to develop advanced skills in the combination of technology in products or for producing products and visual understanding of form and composition in a product design for a given context. The course will focus on theories of perception and cognition in relation to form, complex form analysis, analogies, metaphors, storytelling etc. in order to strengthen the students' professional knowledge of form and how metaphors and analogies influence the target group's perception of form. The study of new technologies will establish an up-to-date knowledge in this field. The course will test this integrated knowledge in a short design task on an advanced level.

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module:

- Must have knowledge of a variety of cutting-edge technologies applicable in products or materials, production and assembly processes, etc. and how these technologies can push design and product development in practice and research
- Must be able to account for and reflect on methods and theories of perception, cognition, metaphors, analogies and storytelling in relation to form, composition and design for a particular company, market segment, market trend or otherwise specified context and target group

SKILLS

Students who complete the module:

- Must be able to identify, analyse and integrate cutting edge technologies with form, function and construction in a conceptual product design proposal
- Must be able to screen and analyse the design potential in new materials and technologies in databases, through contact with companies and sample studies
- Must be able to analyse various types of product design and to specify and communicate their typical expressions within a product category
- Must be able to use advanced methods to analyse and develop form in composition and design to a qualitatively specified desired expression related to a particular company, segment, market trend, product category or otherwise specified context

COMPETENCES

Students who complete the module:

- Must be able to generate a design proposal that through advanced form giving methods and integration of cutting-edge technologies aims precisely at a predefined expression and functionality for a target market

TYPE OF INSTRUCTION

Types of instruction are listed in § 17; Structure and contents of the programme.

EXAM

EXAMS

Name of exam	Technology & Form
Type of exam	Written or oral exam
ECTS	5
Permitted aids	Without aids
Assessment	Passed/Not Passed
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	Teknologi og form
Module code	AODIM2K202
Module type	Course
Duration	1 semester
Semester	Spring
ECTS	5
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Jaeger, Hartmann

ORGANISATION

Study Board	Study Board of Architecture and Design
Department	Department of Architecture, Design and Media Technology
Faculty	The Technical Faculty of IT and Design

TECHNOLOGY INNOVATION DRIVEN BY DESIGN

2023/2024

RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

The module adds to knowledge, skills and competencies obtained during 1st semester in MSc ID.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of this project is to enable students to engage in a technology-based requirement for innovation with a design driven perspective on value creation. With an outset in a business need for innovation based on technology, either development, assimilation or application of new technology, the learning focus is to create and maintain a value focused and meaning making design-based approach.

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module:

- Must be able to account for, evaluate and reflect on concrete case-based knowledge of problems and possibilities for transforming poorly-defined technology opportunities into strategies, concepts and specified product proposals
- Must be able to account for the main critical issues in the design proposal related to the business case, environmental value, technology application, product design and construction, production capability and the appropriate course of action to amend these

SKILLS

Students who complete the module:

- Must be able to identify, research and specify design opportunities and tasks in relation to a concrete technology, including cultural, demographic, market and environmental themes
- Must be able to identify, design in detail and evaluate most relevant production aspect or component construction in order to most effectively support the value proposition of a business
- Must be able to in a team plan, organise and carry out a rapid design process and integrated product development while maintaining a high degree of awareness on linking the technology to identified user needs, key characteristics for proposed products and business model

COMPETENCES

Students who complete the module:

- Must show ability to combine a diversity of analytical and creative tools and methods in an integrated process leading from the identification of opportunities and needs to design and specify a product family or product/service that leverage technology in a meaningful way
- Must be able to clearly describe and communicate a solution that is based on an advanced integration of business, design and engineering

TYPE OF INSTRUCTION

Types of instruction are listed in § 17; Structure and contents of the programme.

EXAM

PREREQUISITE FOR ENROLLMENT FOR THE EXAM

- An approved PBL competency profile is a prerequisite for participation in the project exam

EXAMS

Name of exam	Technology Innovation Driven by Design
Type of exam	Oral exam based on a project
ECTS	20
Permitted aids	Without aids
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	Teknologisk innovation drevet gennem design
Module code	AODIM2P203
Module type	Project
Duration	1 semester
Semester	Spring
ECTS	20
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Jaeger, Hartmann

ORGANISATION

Study Board	Study Board of Architecture and Design
Department	Department of Architecture, Design and Media Technology
Faculty	The Technical Faculty of IT and Design

PROJECT-ORIENTED STUDY IN AN EXTERNAL ORGANISATION

2023/2024

RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

The student is recommended to have knowledge, skills and competencies within the Industrial design engineering field corresponding to the completion of the MSc01 and MSc02 Industrial Design Engineering education or similar.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The objective is to give the students an opportunity to use the skills acquired during the 1st and 2nd semesters and at the same time provide opportunities for the students to explore and gain knowledge of a subject of their own choice within the field of industrial design engineering while acquiring competencies in the rigorous structuring and communication of their knowledge production. The company can often function as a case for the research related to the project assignment.

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module:

- Must be able to identify, define and frame a relevant subject for investigation and research within the field of industrial design engineering
- Must be able to account for relevant theoretical positions and related methodologies pertaining to the chosen subject
- Must be able reflect on the test results in relation to the field and activities of the profession e.g. international professional standards

SKILLS

Students who complete the module:

- Must be able to evaluate and assess the research problem in relation to their completed investigations and/or experiments
- Must be able to frame the research problem taking into account the interdependency between type of knowledge wanted, the possible methods of investigation and type of data produced
- Must be able to communicate results or partial results of the project work in a manner that is on a par with professional research reporting

COMPETENCES

Students who complete the module:

- Must be able to plan and carry out research of a chosen subject and have the capacity to describe the chosen problem in a theoretical and methodological framework as well as to draw conclusions on the basis of own analysis of the results

TYPE OF INSTRUCTION

Types of instruction are listed in § 17; Structure and contents of the programme.

EXAM

EXAMS

Name of exam	Project-Oriented Study in an External Organisation
Type of exam	Oral exam based on a project
ECTS	30
Permitted aids	Without aids
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
Module code	AODIM3P201
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	30
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Jaeger, Hartmann

ORGANISATION

Study Board	Study Board of Architecture and Design
Department	Department of Architecture, Design and Media Technology
Faculty	The Technical Faculty of IT and Design

START-UP AND EXECUTION OF DESIGN

2023/2024

RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

The student is recommended to have knowledge, skills and competencies within the Industrial design engineering field corresponding to the completion of the MSc01 and MSc02 Industrial Design Engineering education or similar.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The objective is to give the students an opportunity to use the skills acquired during the 1st and 2nd semesters to pursue the realization of a project idea. Either by starting up a business or by seeking other ways to pursue the realization of a previously developed project idea. At the same time, the process provides an opportunity to in-depth analysis and reflection on the process of execution, realization of products and the role of design and designers therein. This knowledge production is to be constructed and communicated in a scientific rigorous way.

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module:

- Must be able to identify, define and frame a relevant subject for investigation and research between the field of industrial design engineering and business development, innovation and entrepreneurship theories
- Must be able to account for relevant theoretical positions and related methodologies pertaining to the chosen subject
- Must be able reflect on the findings and results in relation to the field and activities of the profession in a scientifically sound manner

SKILLS

Students who complete the module:

- Must be able to evaluate and assess the research problem in relation to their completed investigations
- Must be able to frame the research problem taking into account the interdependency between type of knowledge wanted, the possible methods of investigation and type of data produced
- Must be able to communicate results or partial results of the project work in a manner that is on a par with professional research reporting

COMPETENCES

Students who complete the module:

- Must be able to plan and carry out research of a chosen subject and have the capacity to describe the chosen problem in a relevant theoretical and methodological framework as well as to draw conclusions on the basis of own analysis of the results

TYPE OF INSTRUCTION

Types of instruction are listed in § 17; Structure and contents of the programme.

EXAM

EXAMS

Name of exam	Start-Up and Execution of Design

Type of exam	Oral exam based on a project
ECTS	30
Permitted aids	Without aids
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	Iværksætteri og gennemførsel af design
Module code	AODIM3P202
Module type	Project
Duration	1 semester
Semester	Autumn
ECTS	30
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Jaeger, Hartmann

ORGANISATION

Study Board	Study Board of Architecture and Design
Department	Department of Architecture, Design and Media Technology
Faculty	The Technical Faculty of IT and Design

MASTER'S THESIS

2023/2024

RECOMMENDED PREREQUISITE FOR PARTICIPATION IN THE MODULE

The student is recommended to have knowledge, skills and competencies within the industrial design and engineering field corresponding to the completion of the MSc01 - MSc03 Industrial Design Engineering education or similar.

CONTENT, PROGRESS AND PEDAGOGY OF THE MODULE

The aim of this project is to provide students with the opportunity to demonstrate their mastery of key competencies in a design engineering based self-driven process.

LEARNING OBJECTIVES

KNOWLEDGE

Students who complete the module:

- Must be able to account for the relevant design related knowledge and identify design relevant problems within the chosen subject
- Must account for the appropriate research-based knowledge in the design process
- Must demonstrate a high degree of awareness regarding the main experiments, tests, proposals and evaluations affecting the decision-making in the design process and thoroughly account for the scientific validity of test, investigations and other type of data used in the design process
- Must demonstrate a high degree of awareness regarding the main critical issues in the design proposal and the appropriate course of action to amend these

SKILLS

Students who complete the module:

- Must be able to design by integrating a desired expression and experience through form and function into technical sound products, constructions and solutions, with due consideration to state-of-the-art technology, manufacturing abilities, costs and configuration of supply chain
- Must demonstrate the ability to frame the design assignment using professional tools and methods and generate a design proposal based on clearly defined values, user needs and or business plan that meets predefined criteria, target values and cost range
- Must demonstrate the ability to select, use and reflect on the appropriate methods for analysing problems, users, technologies, constructions, competitors, markets, products, strategies, companies and own design-based product or solution proposals
- Must demonstrate the ability to select and use the appropriate method, technique and tools for carrying out experiments and synthesising design-based product or solution proposals
- Must demonstrate the ability to navigate a design process, by continuously driving the design process forward by focusing on the most relevant part of the project and delimit the scope accordingly
- Must demonstrate high skills in communicating complex problems and solutions to both peers and non-specialists

COMPETENCES

Students who complete the module:

- Must achieve a high degree of integration of selected appropriate aspects of the subject of choice, in a coherent proposal for a solution within the broad field of design engineering
- Must be able to independently and professionally manage and facilitate a design process that integrates engineering disciplines in order to design innovative solutions that include both technical rigor and design features, while involving relevant stakeholders in the process.
- Must be able to review the final proposal while taking into account both engineering, design, environmental and business perspectives

TYPE OF INSTRUCTION

Types of instruction are listed in § 17; Structure and contents of the programme.

EXAM

EXAMS

Name of exam	Master's Thesis
Type of exam	Master's thesis/final project
ECTS	30
Permitted aids	Without aids
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	AODIM4P201
Module type	Project
Duration	1 semester
Semester	Spring
ECTS	30
Language of instruction	English
Location of the lecture	Campus Aalborg
Responsible for the module	Jaeger, Hartmann

ORGANISATION

Study Board	Study Board of Architecture and Design
Department	Department of Architecture, Design and Media Technology
Faculty	The Technical Faculty of IT and Design