

STUDIEPLAN

Engineering Design - master

120 studiepoeng

Narvik,

Based on the document "Vilkår for bruk av tilleggsetegnelsen Sivilingeniør (siv.ing.)" approved by The Norwegian Association of Higher Education Institutions spring 2016.

The programme description has been approved by the board of Faculty of Engineering Science and Technology on 01.12.2017.

Navn på studieprogram	Bokmål: Engineering Design - master Nynorsk: Engelsk: Engineering Design - Master
Oppnådd grad	Master of Science
Målgruppe	Alle personer som oppfyller opptakskrav
Opptakskrav, forkunnskapskrav, anbefalte forkunnskaper	To be applicable for the master program in Engineering Design, (you must have a relevant undergraduate Bachelor Engineering degree in mechanics, structural or equivalent There is also a requirement of 30 points with preliminaries in mathematics/statistics, equivalent to the Norwegian courses Mathematics 1, 2, and 3, as well as Statistics. Knowledge in Physics (7,5 - 10 ects) on a higher level is recommended to be able to follow different courses on the master programme. Some of the courses in the bachelor programme have a certain amount of physics included and can be accepted.
Politiattest	
Faglig innhold og beskrivelse av studiet	Engineering Design, is design based on engineering science and includes knowledge about product design and computational technology. The main ingredients in Engineering Design is technical scientific computations/calculations and applied mathematics, which is applied to problems related to design, geometry and materials science. Engineering Design courses provides students with an understanding of design and aesthetic design in addition to deep understanding of mathematical and physical principles and methods in the design process. We place special emphasis on the geometry and shape, product and design processes, strength calculations and analysis, materials, computer-based modeling and simulations. The main feature of a product is that it can withstand the stresses it is intended to be exposed to. For example, design and materials adapted to extreme heat or cold, heavy loads over long or short time, and electric or thermal radiation. Sometimes the friction should be as large as possible, while other times it should be as small as possible. Flexible hinges (eg, plastic tops) should withstand being opened and closed many times without going failing. In addition, we may have different requirements and wishes for instance that the product should be as light as possible, as stiff as possible, as cheap as possible or as soundproof as possible, which means that the design and materials must be optimized accordingly. This process requires careful analysis and calculations, specific processes and techniques that you learn during the study period. Good and appropriate solutions to advanced engineering scientific problems can be solved by using the knowledge in the mathematical and physical theories that you work with in the course of the

study. During the course there are also projects where students design, calculate, model, simulate, redesign and create prototypes.

With a master degree in science, in Engineering Design, you will have a broad theoretical platform. This will make you an indispensable resource for any company that is eager to be at the forefront of the technological development.

You learn about the systematic ways to make the right choice of materials and design of various products and structures. Composite materials, modern and advanced materials and structures are important elements of the program. In addition, you learn applied mathematics and theories that are used, among others, to model, visualize, simulate and perform calculations on the products and structural elements. In addition to performing the design, modeling and visualization projects on computers, we also use modeling workshop and the layered production technique or the 3D printer to create a variety of physical prototypes of the products in projects.

De fleste emner har arbeidskrav som når oppfylt gir eksamensrett. Noen emner har krav om oppmøte som følge av laboratorieaktivitet. For å starte på bacheloroppgaven kreves det bestått 100 studiepoeng innen september det skoleåret man normalt skal starte på bacheloroppgaven. For detaljer om arbeidskrav henvises det til emnebeskrivelser for de enkelte emner.

Studiet er heltidsstudium basert på UiT Narvik.

Det er også muligheter for semester-utveksling med utenlandske samarbeidende institusjoner.

Tabell:
oppbygging av
studieprogram

code	Course	2017 Autumn	2018 Spring	2018 Autumn	2019 Spring
SMN6190	Linear Algebra II	5			
STE6301	Structural analysis in engineering	5			
SMN6191	Numerical methods	5			
SMN6197	Fluid mechanics	5			
SMN6203	PDE and the finite element method	7,5			
STE6238	Geometric modeling		5		
STE6290	Material selection in product design.		7,5		
STE6236	Theory of Elasticity		5		
SAD6210	Innovation & economics		5		
STE6241	Product design	2,5	7,5		
SMN6201	Analytical computations			7,5	
SAD6211	Innovation & management			5	
STE6242	Virtual Prototyping			5	
STE6289	Modern Materials and Computations			7,5	
STE6222	Mechanics of Composite Materials			5	
STE6309	Dynamical Systems (alt. to STE6222)				
SHO6263	Diploma thesis M-ID				30
		30	30	30	30
					120

Læringsutbytte -beskrivelse	<p>Knowledge:</p> <ul style="list-style-type: none"> • has advanced knowledge within the academic field of mathematics, physics and engineering and specialized insight in a limited area within the field of engineering design (K1) • has thorough knowledge of different theories and methods in the field of engineering design (K2) • can apply knowledge to new areas within the academic field of numerical and analytical calculations, computations, materials, systematic design process, computational methods, engineering design (K3) • can analyze academic problems on the basis of the history, traditions, distinctive character and place in society of the academic field in engineering (K4) <p>Skills:</p> <ul style="list-style-type: none"> • can analyze and deal critically with various sources of information and use them to structure and formulate scholarly arguments (S1) • can analyze existing theories, and interpretations in the field of engineering design and work independently on practical and theoretical problems (S2) • can use relevant methods in engineering design for research and scholarly in an independent manner (S3) • can carry out an independent, limited research or development project under supervision and in accordance with applicable norms for research ethics (S4) <p>General competence:</p> <ul style="list-style-type: none"> • can analyze relevant academic, professional and research ethical problems (GC1) • can apply the knowledge and skills within engineering design in new areas in order to carry out advanced assignments and projects (GC2) • can communicate extensive independent work and masters language and terminology of the academic field of engineering design (GC3) • can communicate about academic issues, analyses and conclusions in the field of engineering design, both with specialists and the general public (GC4) • can contribute to new thinking and innovation processes (GC5)
Studiets relevans	<p>After completing the master study in Engineering design the candidate has a MsS degree which qualify to start as a PhD-student within relevant ph.d.-areas (i.e. mechanical engineering, applied mathematics, computational methods). UIT Campus Narvik has a ph.d. education within the field of Applied mathematics and computational engineering, which students from Engineering design are qualified to get a position at, if the grading is good enough (for instance for acceptance as a doctoral student), and if there are available positions.</p>
Arbeidsomfang og	Teaching and Learning Methods

læringsaktiviteter	<p>The programme involves lectured courses, as well as a high degree of problem-based education (i.e. learning-by-doing), where the students spend their time working on relevant projects under supervision of a highly qualified staff. The projects are concerned with relevant topics within the field of engineering design.</p> <p>Form of assessment</p> <p>Through the two year master programme in Engineering Design, the students are evaluated in both theoretical knowledge and engineering skills. This evaluation is based on written exams, in addition to written reports and presentation of project results. The programme aims at being international and research-based, and the students will therefore acquire state-of-the-art technological competence.</p>
Eksamen og vurdering	Specified in each course description
For masteroppgaver/ selvstendig arbeid i mastergradsprogram	Mandatory written Master's thesis corresponding to 30 ects
Undervisnings- og eksamensspråk	English
Internasjonalisering og utveksling	It is possible to study parts of the master program at other universities. An individual plan must in this case be made in accordance with the program coordinator.
Praksis	
Administrativt ansvarlig og faglig ansvarlig	Studiet er underlagt Fakultet for Ingeniørvitenskap og Teknologi (IVT), Institutt for datateknologi og beregningsorienterte ingeniørfag (IDBI)
Kvalitetssikring	Studieplanen er underlagt revisjon og kvalitetssikring i samsvar med kvalitetssystemet til IVT
Andre bestemmelser	