UiT Norges arktiske universitet

Program description
Aerospace Engineering - Master

120 Credits/Campus Narvik

Based on the document “Vilkår for bruk av tilleggsbetegnelsen Sivilingeniør (siv.ing.)” approved by The Norwegian Association of Higher Education Institutions spring 2023.

The programme description has been approved by the board of Faculty of Engineering Science and Technology on 16.05.2024

Valid from the academic year 2025/2026

Study programme name	Bokmål: Satellitt- og Droneteknikk, sivilingeniør - master Nynorsk: Satellitt- og Droneteknikk, sivilingeniør - master Engelsk: Aerospace Engineering - master
Degree obtained	Master i teknologi, Satellitt- og Droneteknikk / Sivilingeniør Master of Science in Aerospace Engineering
Target group	The Master program in Aerospace Engineering is aimed at students with an interest in learning about Aerial Robots and Satellites. The program is suitable for students with a Bachelor of Engineering in Satellite Engineering, Drone Technology, Electrical Engineering, Mechanical Engineering, Mechatronics, Computer Engineering or similar.
Admission requirements, required prerequisite, recommended prerequisite knowledge	A relevant undergraduate bachelor in engineering, primarily within electronics or space technology, but it may also be within related fields such as automatic control, communications, power electronics or computer engineering. You must however have a sufficient background in electronics and communications. In addition, the following requirements must be met: • minimum 25 ECTS in mathematics (equivalent to Mathematical Methods 1, 2 og 3) • 5 ECTS in statistics • 7,5 ECTS i physics on a higher level is required. The requirement for physics can be covered by 7.5 ECTS in physics, building physics, fluid mechanics, thermodynamics and/or mechanics of materials.
Certificate of good conduct	N/A
Suitability assessment	N/A
The study programme's Learning Outcome	**Knowledge:** • has advanced knowledge within the field of Aerospace Engineering with a specialized focus on one of the offered disciplines. • has thorough knowledge of the central theories and methods within the field of Aerospace Engineering. • can apply and adapt the obtained knowledge to new areas within Aerospace Engineering. • can analyze problem statements within Aerospace Engineering on the basis of its history, traditions, distinctive characteristics and its influence on society. **Skills:** • can analyze existing theories, and methodologies in the field of Aerospace engineering and work independently on practical

	and theoretical problems. • can use relevant methods for research and development in an independent manner. • can analyse and remain critical to various sources of information and apply them in academic reasoning. • can complete an independent, narrowed research or development project with supervision, that is aligned with current standards of ethics in research. **General competence:** • can analyse relevant academic, professional and research ethical problems. • can apply their knowledge and skills in new areas in order to carry out advanced assignments and projects. • can communicate extensive independent work and masters language and terminology of the academic field. • can communicate about academic issues, analyses and conclusions in the field, both with specialists and the general public. • can contribute to new thinking and innovation processes.
Academic content and description of the study program	The Master of Science in Aerospace Engineering is a 2 year full-time program, or a 3 year part time or a 4 year part time study program consisting of 120 ECTS. It is possible to take part of the studies abroad (exchange programs), provided that external courses are similar in content and scope to those specified in the study plan. The program is applicable for students with an interest in learning, developing and applying state-of-the-art technology for space-related purposes. This type of technology has many similarities with technologies for other extreme environments, such as arctic regions and subsea, and students with interest in development of technologies in such fields will also find this program relevant. The program is an on campus fulltime or part time study in Narvik at the department of Electrical Engineering. The program covers the following disciplines: • Satellite Communication • Satellite Structures, Materials and Mechanisms • Satellite Data Processing • Systems Engineering • Satellite Power Systems • Embedded Systems • Mathematical Modeling and Simulation • Classical Mechanics • Linear Algebra and Numerical Methods • Control Engineering • Artificial Intelligence and Intelligent Agents See the individual course descriptions for more information about their

	contents.

Table 1: programme structure 2 year full time

Semester	10 ECTS		10 ECTS		10 ECTS	
1	STE-3800 Classical Mechanics	STE-3602 Embedded Systems	ELE-36xx Linear systems and control	ELE-36xx Nonlinear systems and control	MAT-3801 Numerical Methods	MAT-3800 Linear Algebra 2
2	STE-3606 Satellite Structure, Materials and Mechanisms	STE-3607 Satellite Data Processing	DTE-3608 Artificial Intelligence and Intelligent Agents - Introduction	STE-3605 Mathematical Modeling and Simulation	STE-3608 Satellite Power Systems	TEK-3501 Innovation and Economics
3	STE-3900 Master Thesis 10 (ECTS)		STE-3609 Systems Engineering		STE-3610 Satellite Communication	TEK-3500 Innovation and Management
4	STE-3900 Master Thesis 30 (ECTS)					

Table 2: programme structure 3 year part time

Semester	**10** credits		**10** credits
1	STE-3800 Classical Mechanics (5 ECTS)		MAT-3801 Numerical Methods (5 ECTS)
	STE-3602 Embedded Systems (5 ECTS)		MAT-3800 Linear Algebra II (5 ECTS)
2	STE-3606 Satellite Structure, Materials and Mechanisms (5 ECTS)		DTE-3608 Artificial Intelligence and Intelligent Agents (5 ECTS)
	STE-3607 Satellite Data Processing (5 ECTS)		STE-3605 Mathematical Modeling and Simulation (5 ECTS)
3	ELE-36XX Linear Control Engi-neering	ELE-36XX Nonlinear Control Engineering	STE-3610 Satellite Communication (5 ECTS)
			TEK-3500 Innovation and Management (5 ECTS)
4	STE-39xx Master Thesis (10 ECTS)		STE-3608 Satellite Power Systems (5 ECTS)
			TEK-3501 Innovation and Economics (5 ECTS)
5	STE-39xx Master Thesis (10 ECTS)		STE-3609 Systems Engineering (10 ECTS)
6	STE-39xx Master Thesis (20 ECTS)		

Table 3: programme structure 4 year part time

Semester	**10** credits		**5** credits
1	MAT-3801 Numerical Methods (5 ECTS)		STE-3800 Classical Mechanics (5 ECTS)
	MAT-3800 Linear Algebra II (5 ECTS)		
2	STE-3606 Satellite Structure, Materials and Mechanisms (5 ECTS)		DTE-3608 Artificial Intelligence and Intelligent Agents (5 ECTS)
	STE-3605 Mathematical Modeling and Simulation (5 ECTS)		
3	ELE-36xx Linear Control Engineering	ELE-36xx Nonlinear Control Engi-neering	STE-3602 Embedded Systems (5 ECTS)
4	STE-3608 Satellite Power Systems (5 ECTS)		
	STE-3607 Satellite Data Processing (5 ECTS)		TEK-3501 Innovation and Economics (5 ECTS)
5	STE-3609 Systems Engineering (10 ECTS)		STE-3610 Satellite Communication (5 ECTS)
6	STE-39XX Master Thesis (15 ECTS)		
7	STE-39XX Master Thesis (10 ECTS)		TEK-3500 Innovation and Management (5 ECTS)
8	STE-39xx Master Thesis (15 ECTS)		

Learning activites, examination and assessement	Learning activities is completed differently depending on the subject. The traditional lecture model is commonly used, in addition, some instances occur where variants of flipped classroom is used. In a traditional lecture model, the teacher gives lectures at scheduled hours. A portion of the scheduled lectures will, however, be reserved for other learning activities such as problem solving, completing mandatory work, project work or laboratory work. The person with course responsibility or teaching assistants will be present to provide guidance at these events. The students learn through preparation and working on the lectured theory, completing mandatory coursework requirements, doing problem solving, project work together in groups, laboratory work, self-evaluating and a fair amount of self-study. When utilizing flipped classroom the lectures is moved out of the classroom and is done as part of the preparation by the student and thus the student itself has the responsibility of completing the lectures. The preparation part usually consist of students watching pre-recorded videos, in addition to studying recommended parts of the reading list, notes and recommended relevant materials. The scheduled hours at the

	university is then used for reviewing a specific subject matter, and mainly for problem solving. The flipped classroom model can also be used in a “hybrid”-model where parts of the subject is done using the traditional lecture model and other parts is completed using the flipped classroom model. The students learn through the same mechanisms as mentioned for the traditional lecture model above, however the students have a larger responsibility them self to acquire the knowledge necessary for problem solving. It is important that the student knows the difference between problem solving, coursework requirements, and evaluation. Coursework requirements is mandatory requirements that’s has been precisely formulated in the course description. In order for the student to be assessed, the course requirements must be approved. Task given in problem solving sessions are task that not necessarily will be marked; these are given to the students for practice and/or preparation for bigger task such as coursework requirements. It shall be made clear when a task is presented whether or not it is voluntary or part of the coursework requirements. Mandatory coursework requirements may for instance be formulated as “X of Y mandatory tasks must be approved” “the student must be present 70% of the scheduled hours” The person with course responsibility makes a list of students with approved coursework requirements to the exams office. Only those with approved coursework will be assessed. The manner of which the students are assessed is described precisely in the course description of individual courses. This may for instance be • Written exam (pen and paper) • Oral exam • Combined of several works, which may include a written exam • Group exam • Portfolio assessment The opportunity for completing a re-sit exam (re-assessment) in a course may vary between courses. Details may be found in the specific course description. Attending the learning activities in the various courses provides the students’ knowledge on scientific theory and experience using the scientific method. Subject matter in the specific courses is based on relevant and in some cases state-of-the-art research. Some courses require mandatory health, security and environment (HSE) training before students are allowed access and given permission to work in laboratories, workshops and similar. This also goes for participation in fieldwork/research cruises and similar. Please contact your immediate supervisor for list of mandatory courses.

The study programme's relevance	Successfully qualified candidates can acquire jobs in a range of Norwegian businesses, which contribute technical products and services within aerospace and satellite technology, but also within fields as subsea engineering, systems engineering, or robotics and automation. The program also provides a basis for working with project management and marketing, or teaching in technical subjects at Bachelor's level. The degree qualifies to start as a PhD-student within relevant ph.d.-areas (i.e. engineering cybernetics, applied mathematics,control engineering, engineering science). UIT Campus Narvik has a ph.d. education within the field of Engineering science, which students from Aerospace Engineering are qualified to get a position at, if the grades are sufficient (for instance for acceptance as a doctoral student), and if there are available positions. The academic content, learning activities and assessments presented in this study plan ensure relevance to the current state-of-the-art in the field of Aerospace Engineering.
Work scope	The students shall expect to work 40 hour pr. week with their full time studies, including lectures, seminars and self-studies.
For master's theses/independent work in master's degrees	The final master thesis (diploma) can be carried out in close collaboration with industry partners and/or on the basis of existing research and development projects. The work is usually performed individually. Regular status meetings will be held through the entire project period. The diploma will be evaluated solely based on a final written report.
Language of instruction and examination	English
Internationalisation	A master in Aerospace Engineering has an international perspective, as the aerospace field itself is indeed very international. The students get an international perspective through English language curriculum, international lecturers and different learning activities.
Student exchange	The Faculty of Engineering Science and Technology facilitates student exchange for interested students so that it is possible to study parts of the master's program at other universities. An individual plan must then be drawn up in consultation with the study coordinator.
Supervised professional training	
Administrative responsibility and academic responsibility	Faculty of Engineering Science and Technology, Department of Electrical Engineering

Quality assurance	The study plan is subject to revision and quality assurance in accordance with the quality assurance program at IVT with regards to the conditions on use of the protected tittle Sivilingeniør (Siv. Ing.) acknowledged by NRT.
Other regulations