



Programme syllabus

Master's Programme, Aerospace Engineering, 120 credits

Masterprogram, flyg- och rymdteknik

120.0 credits

Valid for students admitted to the education from autumn 08 (HT - Autumn term; VT - Spring term).

This is a translation of the Swedish, legally binding, programme syllabus.

Programme objectives

The main objective of this programme is to educate skilled engineers for the European aerospace industry and research institutions. The programme is mainly intended for (but not exclusive to) Swedish students and students from European universities with which KTH has exchange agreements. It is a joint effort by several different KTH departments, providing leading expertise in their respective areas of research. The Department of Aeronautical and Vehicle Engineering coordinates the programme and contributes about half of the courses.

Knowledge and understanding

A Master of Science in Aerospace Engineering will:

- have a good ability to independently apply mathematics and basic engineering science in the field of aerospace engineering,
- be able to formulate and approach new problem settings in a scientific manner, by having a creative, critical and systematic attitude to engineering practice.

Skills and abilities

A Master of Science in Aerospace Engineering will be able to:

- work out solution strategies to real engineering problems, knowing the capabilities and limitations of different methods and tools,
- plan, perform and evaluate basic experimental testing in order to investigate the validity of a theoretical model,
- work efficiently in a teamwork environment in groups with different compositions,
- work efficiently in an international environment, in particular where English is the professional language,

- communicate results and conclusions in a competent and intelligible manner, both orally and in writing,
- follow and participate in aerospace research and development.

Ability to make judgements and adopt a standpoint

A Master of Science in Aerospace Engineering will be able to:

- critically judge a situation and in an independent manner acquire the information and knowledge that is necessary to establish a qualified standpoint,
- have the ability to identify the need for further knowledge in the field and take responsibility for keeping their personal knowledge up to date.

Complete information on the degree requirements can found at the local degree policy of KTH, see <http://www.kth.se/info/kth-handboken/II/19/1.html>

Extent and content of the programme

Aerospace Engineering is a two-year (120 university credits) master programme on the advanced level (second cycle). The instruction language is entirely in English. The programme consists of a basic curriculum followed by four different specializations in aeronautics, space, structures or systems. The courses in the basic curriculum are compulsory and constitutes about half of the course work. In each specialization there is an additional set of three compulsory courses to ensure that the students are qualified to perform a final Master's thesis project.

Eligibility and selection

Basic eligibility requirements

A completed Bachelor's degree, equivalent to a Swedish Bachelor's degree (180 university credits), from a university recognized by government or accredited by other recognized organization. A good knowledge of written and spoken English. Applicants must provide proof of their proficiency in English.

Specific eligibility requirements

The applicant must have a basic degree, Bachelor's or similar, from an aeronautical, mechanical engineering, or similar programme with sufficient theoretical depth and good academic results. Course work must include multivariable calculus, linear algebra, numerical analysis, ordinary differential equations, rigid body mechanics, solid mechanics, and fluid mechanics.

Selection process

The selection process is based on a total evaluation of the following criteria: University, Grade Point Average (GPA), and relevant course work. Courses on topics such as complex analysis, partial differential equations, thermodynamics, and control theory are considered an additional qualification.

Complete information on the eligibility requirements can be found at the local admission policy of KTH, see <http://www.kth.se/info/kth-handboken/II/11/inledning.html>

Implementation of the education

Structure of the education

The academic year at KTH is divided into four periods. Each period lasts approximately seven weeks with at least 33 days of study. Each period is followed by an exam period consisting of two extra days and at least 5 exam days. In addition to the four regular exam periods, there are three additional re-examination periods: after Christmas, after May and immediately preceding the first study period of the academic year. The academic year lasts for a duration of 40 weeks. Teaching activities may, if necessary, be scheduled outside the academic year.

The first year in the programme is mainly dedicated to the compulsory courses in the basic curriculum. However, some courses in the specializations are also given in the first year, in order to harmonize the master programme and the final part of the five-year engineering education at KTH. The second year mainly consists of elective courses and the final degree project, although it depends on the chosen specialization.

Courses

The programme is course-based. Lists of courses are included in [appendix 1](#).

The programme is course-based. Lists of courses are included in Appendix 1. The basic curriculum corresponds to approximately 45 university credits. In each specialization, there is an additional set of three compulsory courses, corresponding to approximately 20 university credits. This leaves approximately 25 university credits for optional (elective) courses. The optional courses should be on the advanced level, and preferably be related to aerospace engineering.

Grading system

Courses in the first and the second cycle are graded on a scale from A to F. A-E are passing grades, A is the highest grade. The grades pass (P) and fail (F) are used for courses under certain circumstances.

Conditions for participation in the programme

No later than November 15 and May 15 each academic year, respectively, the students are required to make a study registration and course selection for the coming term. At least 40 university credits have to be completed during the first academic year (including the re-examination period in August) in order for the student to be promoted to the second year of the programme.

Students have to make a decision about the specialization in the very beginning of the programme. In particular, this holds for the systems branch of which some courses are given already in the first period. The programme director will inform about the different options during the reception at KTH.

Recognition of previous academic studies

Under certain circumstances, and in agreement with the programme director, credits for previous studies can be received according to the local policy of KTH, see <http://www.kth.se/info/kth-handboken/II/13/3.html>

Degree project

Students admitted to the programme are required to perform an independent study in the form of a thesis project corresponding to 30 university credits. To begin the thesis project, a student must have completed at least 65 university credits of the total course work and at least two of the three compulsory courses in the specialization.

The purpose of the thesis project is that the student should demonstrate the ability to perform independent project work, using and developing the skills obtained from the courses in the programme. The thesis project can either be performed at a university or, more commonly, at a company in the aerospace sector with suitable infrastructure to provide sufficient supervision and resources for the project. The student must actively search for a suitable thesis project in industry; however KTH will provide some assistance with information on suitable points of contact. Exchange students are recommended to find a thesis project in their country of permanent residence or in the country where they intend to start their professional careers.

More information on the KTH policy on the degree project can be found at <http://www.kth.se/info/kth-handboken/II/15/1.html>

Degree

Students who fulfill all the requirements will be awarded a Degree of Master of Science (two years). Students must apply for the degree and also show proof of their basic degree (Bachelor's or similar) and paid student union fee.

Complete information on the degree requirements can be found in the local degree policy of KTH, see <http://www.kth.se/info/kth-handboken/II/19/1.html>

[Appendix 1 - Course list](#)

[Appendix 2 - Programme syllabus descriptions](#)



Appendix 1: Course list

Master's Programme, Aerospace Engineering, 120 credits (TAEEM),
Programme syllabus for studies starting in autumn 2008

General courses

Year 1

Mandatory courses (38.0 Credits)

Course code	Course name	Credits	Edu. level
DN2225	Numerical Solutions of Differential Equations	6.0 hp	Second cycle
EL1820	Modelling of Dynamical Systems	6.0 hp	First cycle
SD2411	Lightweight Structures and FEM Studied the second year of the spec. Systems	8.0 hp	Second cycle
SD2600	Aircraft Performance Analysis Studed the second year of the spec. Systems	6.0 hp	Second cycle
SD2815	Rocket Science	6.0 hp	Second cycle
SF1841	Optimization	6.0 hp	First cycle

Year 2

Mandatory courses (7.5 Credits)

Course code	Course name	Credits	Edu. level
AK2036	Theory and Methodology of Science with Applications (Natural and Technological Science)	7.5 hp	Second cycle

Aeronautics (FLT)

Year 1

Mandatory courses (24.0 Credits)

Course code	Course name	Credits	Edu. level
SD2610	Computational Aerodynamics	9.0 hp	Second cycle
SD2800	Experimental Aerodynamics	6.0 hp	Second cycle
SD2805	Flight Mechanics	9.0 hp	Second cycle

Year 2

Recommended courses

Course code	Course name	Credits	Edu. level
SD2615	Air Traffic Management and Modern Avionics	6.0 hp	Second cycle
SD2810	Aeroelasticity	9.0 hp	Second cycle

Lightweight Structures (LKR)

Year 1

Mandatory courses (18.0 Credits)

Course code	Course name	Credits	Edu. level
SD2413	Fibre Composites - Analysis and Design	6.0 hp	Second cycle
SD2414	Fibre Composites - Materials and Manufacturing	6.0 hp	Second cycle
SD2416	Structural Optimisation and Sandwich Design	6.0 hp	Second cycle

Year 2

Recommended courses

Course code	Course name	Credits	Edu. level
SD2415	Process Modelling for Composite Manufacturing	6.0 hp	Second cycle
SD2450	Biomechanics and Neuronics	6.0 hp	Second cycle
SD2505	Biomaterials and Products	7.0 hp	Second cycle

Space (RMD)

Year 2

Mandatory courses (21.0 Credits)

Course

code	Course name	Credits	Edu. level
EF2240	Space Physics	6.0 hp	Second cycle
EF2260	Space Environment and Spacecraft Engineering	6.0 hp	Second cycle
SH2771	Spacecraft Dynamics	9.0 hp	Second cycle

Systems Engineering (SYS)

Year 1

Mandatory courses (22.5 Credits)

Course code	Course name	Credits	Edu. level
EL2520	Control Theory and Practice, Advanced Course	7.5 hp	Second cycle
SF2862	Stochastic Decision Support Models	7.5 hp	Second cycle
SF2937	Reliability Theory	7.5 hp	Second cycle

Year 2

Recommended courses

Course code	Course name	Credits	Edu. level
EL2620	Nonlinear Control	7.5 hp	Second cycle
SF2812	Applied Linear Optimization	7.5 hp	Second cycle
SF2822	Applied Nonlinear Optimization	7.5 hp	Second cycle



Appendix 2: Specialisations

Master's Programme, Aerospace Engineering, 120 credits (TAEEM),
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Aeronautics (FLT)

Lightweight Structures (LKR)

Space (RMD)

Systems Engineering (SYS)