Programme syllabus

Master's Programme, Sound and Vibration, 120 credits
Masterprogram, ljud och vibrationer
120.0 credits

Valid for students admitted to the education from autumn 09 (HT - Autumn term; VT - Spring term).

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

Programme objectives

Noise and vibration are important issues in modern society. Applications of technical acoustics cover an extremely wide field, from applied mathematics and mechanics to measurement techniques plus signal processing down to engines, transport and building technology. This programme provides a platform for a successful career in industry or continuation towards a PhD. The objective of the programme is to encourage and enable students to learn advanced topics in sound and vibration control, especially in the field of vehicle engineering. Students may also develop their own specialisation through numerous elective courses. The programme is well balanced between theoretical studies and practical applications.

Knowledge and understanding

A Master of Science in Sound and Vibration will:

- have the ability to independently apply mathematics and basic engineering science in the field of sound and vibration.
- have the ability to master and apply basic principles in the field of sound and vibration.
- be able to be creative and critical in order to formulate and investigate problems using modern methods and tools.

Skills and abilities

A Master of Science in Sound and Vibration will be able to:

- have the ability to critically and systematically analyse, judge and handle complex problems and situations even with access to limited information.
- have the ability to critically, independently and creatively formulate problems and to plan and perform work within given time limits.
- have the ability to, both orally and in writing, communicate and discuss conclusions and the underlying theory and argumentation.
be able to follow the latest development and research and have the ability to participate in research and development work in the field of sound and vibration.

communicate results and conclusions in a competent and intelligible manner, both orally and in writing.

**Ability to make judgements and adopt a standpoint**

A Master of Science in Sound and Vibration will:

- have the ability to in the field of sound and vibration make decisions regarding research and development work based on relevant scientific, societal and ethical aspects.
- show insight regarding the possibilities and limitations of engineering science and its role in the society.
- have 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**

Sound and Vibration is a two-year (120 university credits) master programme on the advanced level (second cycle). The instruction language is English.

**Eligibility and selection**

**Basic eligibility requirements**

A Bachelor degree equivalent to a Swedish Bachelor's degree (180 ECTS), from a university recognized by government or accredited by other recognized organization. Students in their final year of undergraduate education may also apply and if qualified, receive a conditional acceptance. A good knowledge of written and spoken English is required. Applicants must provide proof of their proficiency in English. KTH accepts a TOEFL test score of a minimum of 550 (213 in the computer-based test, 79 in the internet based test) or an IELTS score of at least 6.0, no band lower than 5.0 (both general and academic accepted). English proficiency tests are waived for applicants with English as language of instruction (minimum 3 years of full-time higher education studies). A relevant certificate from the university has to be enclosed with the application. For EU citizens from KTH’s partner universities, a certificate from the University language department or the relevant Head of department stating the student's good level of English will be enough.

**Specific eligibility requirements**

The applicant must have a basic degree, bachelor or similar, from mechanical engineering, or similar programme with sufficient theoretical depth and good academic results.

**Selection process**
The selection process is based on a total evaluation of the following criteria: University, Grade Point Average (GPA), and relevant course work. 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 has 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 sound and vibration curriculum with 42 university credits. This leaves room for 18 university credit points of elective courses. The second year mainly consists of elective courses and the final degree project.

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 compulsory courses correspond to 50 university credits. This leaves 40 university credits for optional (elective) courses. The optional courses should be on the advanced level, and preferably be related to sound and vibration applications.

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.

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.
Studies abroad

The Sound and Vibration Programme is currently participating in the pioneering NINA cooperation with Chalmers and NTNU providing the possibility for students to take elective courses at the other participating universities.

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 including at least 32 university credits from the compulsory courses.

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. 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.

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 or similar) and paid student union fee.

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

Appendix 1 - Course list
Appendix 2 - Programme syllabus descriptions
Appendix 1: Course list

Master's Programme, Sound and Vibration, 120 credits (TSOVM), Programme syllabus for studies starting in autumn 2009

General courses

Year 1

Mandatory courses (42.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD2110</td>
<td>Introduction to Noise Control</td>
<td>3.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2130</td>
<td>Signal Analysis</td>
<td>8.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2145</td>
<td>Vibro-Acoustics</td>
<td>11.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2155</td>
<td>Flow Acoustics</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2165</td>
<td>Acoustical Measurements</td>
<td>8.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2170</td>
<td>Energy Methods</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

Optional courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD2150</td>
<td>Experimental Structure Dynamics, Project Course</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2175</td>
<td>Numerical Methods for Acoustics and Vibration</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2225</td>
<td>Ground Vehicle Dynamics, Basic Course</td>
<td>11.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2218</td>
<td>Turbulence</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

Year 2

Mandatory courses (7.5 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>AK2036</td>
<td>Theory and Methodology of Science with Applications (Natural and Technological Science)</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>
Optional courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DT2213</td>
<td>Musical Communication and Music Technology</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2180</td>
<td>Non-linear Acoustics</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2190</td>
<td>Vehicle Acoustics and Vibration</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2413</td>
<td>Fibre Composites - Analysis and Design</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>
Appendix 2: Specialisations

Master's Programme, Sound and Vibration, 120 credits (TSOVM), Programme syllabus for studies starting in autumn 2009

This programme has no specialisations.