Programme syllabus

Master's Programme, Engineering Mechanics, 120 credits
Masterprogram, teknisk mekanik
120.0 credits

Valid for students admitted to the education from autumn 17 (HT - Autumn term; VT - Spring term).

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

Programme objectives

Engineering Mechanics is an important part of the design process for a large range of products. As requirements become more complex and challenging, the demand for engineers trained to deal with advanced mechanical problems is increasing. The objective of the programme is to encourage and enable students to learn advanced topics in Engineering Mechanics. The programme is well balanced between theoretical studies and practical applications and thus provides a platform for a successful career in industry or continuation towards a PhD.

Knowledge and understanding

A master of science in Engineering Mechanics will:

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

Skills and abilities

A master of science in Engineering Mechanics will:

- have the ability to critically and systematically analyse, judge and handle complex mechanical 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 engineering mechanics.
- 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 Engineering Mechanics will:

- have the ability to make decisions in the field of engineering mechanics 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 the personal knowledge up to date.
Complete information on degree requirements can be found at the local degree policy of KTH, www.kth.se.

**Extent and content of the programme**

Engineering Mechanics is a two-year (120 ECTS) master programme on the advanced level (second cycle) and starts in the end of August each year. The programme is composed of three two-year tracks: Fluid Mechanics, Solid Mechanics and Sound and Vibration. The language of the programme is English.

**Eligibility and selection**

**General eligibility requirements**

A completed Bachelor's degree, corresponding to a Swedish Bachelor's degree (180 ECTS), or equivalent academic qualifications from an internationally recognised university.

English language proficiency equivalent to (the Swedish upper secondary school) English course B/6. There are different ways to fulfill the English language requirements, see: www.kth.se

**Specific eligibility requirements**

The applicant must have a basic degree, Bachelor’s or similar, from a mechanical, aeronautical engineering, engineering physics, or similar programme with sufficient theoretical depth and good academic results.

Course work must include multivariable calculus, linear algebra, numerical analysis, differential equations and transforms corresponding to at least 25 ECTS. Courses work must also include classical mechanics, physics, solid mechanics, fluid mechanics, sound and vibrations.

**Selection process**

The selection process is based on the following selection criteria: University, previous studies (for instance GPA), motivation for the studies (for instance letter of motivation, references).

The evaluation scale is 1-75.

The applicant may get a lower evaluation score if a filled-in program-specific summary sheet is missing from the application documents.

**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. In addition to the four regular exam periods, there are four additional re-examination periods: before Christmas, in April, 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.

**Courses**

The programme is course-based. Lists of courses are included in appendix 1.

The programme is course-based and the course part corresponds to 90 ECTS (the thesis is 30 ECTS). Each track starts with basic courses, which must be selected if equivalent courses are not included in the student’s Bachelor’s degree. The basic courses for each track are listed in Appendix 1. The compulsory courses correspond to between 21.5 and 37.5 ECTS depending on track. This leaves between 52.5 and 68.5 ECTS for elective courses. The first part of the elective courses must be on the advanced level and selected from the list of courses in Appendix 1. Together with the
compulsory courses, the first part of the elective courses shall add up to at least 70 ECTS. The choice of elective courses from the list in Appendix 1 is not completely free, because each track has a pool of four to six courses and at least one of these recommended courses must be selected. The remaining second part of the elective courses, at most 20 ECTS, does not need to be selected from the course list in Appendix 1, but an elective course may not be similar to a course already completed in a previous degree.

The list of compulsory and elective courses is given in appendix 1.

**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.

The grades pass (P) and fail (F) are used for thesis works.

**Conditions for participation in the programme**

**Course application**

All programme students apply for courses 1-15 November/1-15 May for the next semester. The application is done via universityadmissions.se

**Semester registration**

Everyone admitted to an educational programme at KTH must register for the semesters they intend to study. Semester registration is a prerequisite and is required for the registration and reporting of results on courses. You can carry out a web registration at the same time as the semester starts, provided that you have fulfilled requirements for the coming semester.

**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.

**Studies abroad**

After approval by the programme director, part of the studies may be carried out abroad (including the Master’s degree project). The condition is that the parts of the programme carried out abroad should fit in with the educational programme.

**Degree project**

A 30-credit Master’s degree project is carried out at the end of the educational programme (usually the fourth semester). The purpose of the project is to let the student study a problem in more depth than is possible in the courses. The project may be carried out in an academic or industrial environment in Sweden or abroad. To be allowed to start a degree project, a student must have accumulated at least 60 credits.

The choice of project must be approved by the programme director.

The Degree project is graded with P/F.

**Degree**

In order to earn a Degree of Master of Science, passing grades in all courses which are included in the student’s study plan are required. The study plan must comprise 120 higher education credits which include a degree project consisting of 30 higher education credits, in the second cycle.

KTH’s local degree ordinance can be found at KTH’s website, www.kth.se.

**Application for degree certificate**
When the studies at KTH are completed a degree certificate can be applied for.

Application is done by the "personal menu" at www.kth.se

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

Master's Programme, Engineering Mechanics, 120 credits (TTEMM), Programme syllabus for studies starting in autumn 2017

## General courses

### Year 1

#### 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>AK2030</td>
<td>Theory and Methodology of Science (Natural and Technological Science)</td>
<td>4.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2128</td>
<td>Research Methodology in Engineering Mechanics</td>
<td>3.0</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

#### Conditionally elective courses

<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</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2111</td>
<td>Engineering Acoustics</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2125</td>
<td>Signals and Mechanical Systems</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2140</td>
<td>Vibro Acoustics</td>
<td>8.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2150</td>
<td>Experimental Structure Dynamics, Project Course</td>
<td>9.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2155</td>
<td>Flow Acoustics</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2165</td>
<td>Acoustical Measurements</td>
<td>8.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2175</td>
<td>Numerical Methods for Acoustics and Vibration</td>
<td>9.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SE1025</td>
<td>FEM for Engineering Applications Given in English in per 1 and in Swedish in per 3.</td>
<td>6.0</td>
<td>First cycle</td>
</tr>
<tr>
<td>SE2121</td>
<td>Introduction to Biomechanics</td>
<td>9.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SE2123</td>
<td>Testing Techniques in Solid Mechanics</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SE2126</td>
<td>Material Mechanics</td>
<td>9.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SE2129</td>
<td>Fracture Mechanics and Fatigue</td>
<td>9.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SE2132</td>
<td>Applied Elasticity with FEM</td>
<td>9.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>Course code</td>
<td>Course name</td>
<td>Credits</td>
<td>Edu. level</td>
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</tr>
<tr>
<td>SE2134</td>
<td>Dynamic Problems in Solid Mechanics</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SE2151</td>
<td>Paper Mechanics</td>
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<td>Second cycle</td>
</tr>
<tr>
<td>SE2860</td>
<td>FEM Modelling</td>
<td>8.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2211</td>
<td>Vehicle Aerodynamics</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2212</td>
<td>Computational Fluid Dynamics</td>
<td>7.5</td>
<td>Second cycle</td>
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<td>SG2214</td>
<td>Fluid Mechanics</td>
<td>7.5</td>
<td>Second cycle</td>
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<td>SG2215</td>
<td>Compressible Flow</td>
<td>7.5</td>
<td>Second cycle</td>
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<tr>
<td>SG2218</td>
<td>Turbulence</td>
<td>7.5</td>
<td>Second cycle</td>
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<tr>
<td>SG2221</td>
<td>Wave Motions and Hydrodynamic Stability</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
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<td>SG2222</td>
<td>Micro Fluids</td>
<td>4.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2224</td>
<td>Applied Computational Fluid Dynamics</td>
<td>5.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2225</td>
<td>Fluid Mechanics Continuation Course</td>
<td>4.0</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

**Supplementary information**

The course requirements for each track are listed below. Note that for all tracks at least one of the courses recommended for Year 1 or Year 2 is required.

**Fluid Mechanics track**

Mandatory courses + recommended courses + conditionally elective courses = at least 70 hp.

**Solid Mechanics track**

Mandatory courses + at least one recommended course.

**Sound and Vibration track**

Mandatory courses + recommended courses + conditionally elective courses = at least 70 hp.

Students who have studied SG1215 shall select SG2225 instead of SG2214.

**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>AK2030</td>
<td>Theory and Methodology of Science (Natural and Technological Science)</td>
<td>4.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2128</td>
<td>Research Methodology in Engineering Mechanics</td>
<td>3.0</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>
Conditionally elective courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD2111</td>
<td>Engineering Acoustics</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2125</td>
<td>Signals and Mechanical Systems</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2165</td>
<td>Acoustical Measurements</td>
<td>8.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2166</td>
<td>Building Acoustics and Community Noise</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2180</td>
<td>Non-linear Acoustics</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2190</td>
<td>Vehicle Acoustics and Vibration</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SE2126</td>
<td>Material Mechanics</td>
<td>9.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SE2128</td>
<td>Computational Material Mechanics</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SE2132</td>
<td>Applied Elasticity with FEM</td>
<td>9.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SE2135</td>
<td>Fatigue, Reliability and Design</td>
<td>9.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SE2137</td>
<td>Fatigue</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SE2860</td>
<td>FEM Modelling</td>
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<td>Second cycle</td>
</tr>
<tr>
<td>SG2010</td>
<td>Project Course in Engineering Mechanics</td>
<td>15.0</td>
<td>Second cycle</td>
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<tr>
<td>SG2150</td>
<td>Rigid Body Dynamic</td>
<td>7.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2214</td>
<td>Fluid Mechanics</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2218</td>
<td>Turbulence</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2219</td>
<td>Advanced Compressible Flows</td>
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<td>Second cycle</td>
</tr>
<tr>
<td>SG2221</td>
<td>Wave Motions and Hydrodynamic Stability</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2225</td>
<td>Fluid Mechanics Continuation Course</td>
<td>4.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2226</td>
<td>Wind Energy Aerodynamics</td>
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<td>Second cycle</td>
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<tr>
<td>SG2804</td>
<td>Biomechanics of Human Movement</td>
<td>7.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2870</td>
<td>Non - Linear Finite Element Methods</td>
<td>7.0</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

Supplementary information
The course requirements for each track are listed below. Note that for all tracks at least one of the courses recommended for Year 1 or Year 2 is required.

Fluid Mechanics track
Mandatory courses + recommended courses + conditionally elective courses = at least 70 hp.

Solid Mechanics track
Mandatory courses + at least one recommended course.

Sound and Vibration track
Mandatory courses + recommended courses + conditionally elective courses = at least 70 hp.
Students who have studied SG1215 shall select SG2225 instead of SG2214.

Year 3

**Track, Fluid Mechanics (TEMA)**

Year 1

**Mandatory courses (44.0 credits)**

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG1215</td>
<td>Fluid Mechanics</td>
<td>4.0</td>
<td>First cycle</td>
</tr>
<tr>
<td>SG1220</td>
<td>Fluid Mechanics for Engineers</td>
<td>6.0</td>
<td>First cycle</td>
</tr>
<tr>
<td>SG2212</td>
<td>Computational Fluid Dynamics</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2214</td>
<td>Fluid Mechanics</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2215</td>
<td>Compressible Flow</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2218</td>
<td>Turbulence</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2225</td>
<td>Fluid Mechanics Continuation Course</td>
<td>4.0</td>
<td>Second cycle</td>
</tr>
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</table>

*For students who has studied SG1215

**Recommended courses**

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD2155</td>
<td>Flow Acoustics</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SE1025</td>
<td>FEM for Engineering Applications</td>
<td>6.0</td>
<td>First cycle</td>
</tr>
</tbody>
</table>

*Given in English in per 1 and in Swedish in per 3

**Supplementary information**

At least one of the recommended courses under year one and two has to be studied.

*SG1220 and SG1215 are basic courses. For students who has not studied corresponding course before, one has to be studied.

Students who have studied SG1215 shall select SG2225 instead of SG2214.

Year 2

**Recommended courses**

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
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<tbody>
<tr>
<td>SD2180</td>
<td>Non-linear Acoustics</td>
<td>6.0</td>
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</table>
### Course Table

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE2126</td>
<td>Material Mechanics</td>
<td>9.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SE2132</td>
<td>Applied Elasticity with FEM</td>
<td>9.0</td>
<td>Second cycle</td>
</tr>
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</table>

**Supplementary information**
At least one of the recommended courses under year one and two has to be studied.

### Track, Solid Mechanics (TEMB)

#### Year 1

**Mandatory courses (32.0 credits)**

<table>
<thead>
<tr>
<th>Course code</th>
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<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>SE1025</td>
<td>FEM for Engineering Applications</td>
<td>6.0</td>
<td>First cycle</td>
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<tr>
<td></td>
<td><em>For students who has not studied corresponding course before</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE2126</td>
<td>Material Mechanics</td>
<td>9.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SE2132</td>
<td>Applied Elasticity with FEM</td>
<td>9.0</td>
<td>Second cycle</td>
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<tr>
<td>SE2860</td>
<td>FEM Modelling</td>
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**Recommended courses**

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD2140</td>
<td>Vibro Acoustics</td>
<td>8.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2150</td>
<td>Experimental Structure Dynamics, Project Course</td>
<td>9.0</td>
<td>Second cycle</td>
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**Supplementary information**
At least one of the recommended courses under year one or two has to be studied.

#### Year 2

**Recommended courses**

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
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<tbody>
<tr>
<td>SD2125</td>
<td>Signals and Mechanical Systems</td>
<td>6.0</td>
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<tr>
<td>SG1220</td>
<td>Fluid Mechanics for Engineers</td>
<td>6.0</td>
<td>First cycle</td>
</tr>
<tr>
<td>SG2150</td>
<td>Rigid Body Dynamic</td>
<td>7.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2214</td>
<td>Fluid Mechanics</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SG2225</td>
<td>Fluid Mechanics Continuation Course</td>
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<td>Second cycle</td>
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</table>
### Course code

<table>
<thead>
<tr>
<th>Course code</th>
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<tbody>
<tr>
<td>SG2870</td>
<td>Non-Linear Finite Element Methods</td>
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<td>Second cycle</td>
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</table>

**Supplementary information**

At least one of the recommended courses under year one or two has to be studied.

Students who have studied SG1215 shall select SG2225 instead of SG2214.

SG1220 Fluid Mechanics (Not for student who has already studied a basic course in Fluid Mechanics)

### Track, Sound and Vibrations (TEMC)

#### Year 1

**Mandatory courses (14.0 credits)**

<table>
<thead>
<tr>
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<th>Course name</th>
<th>Credits</th>
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<td>SD2140</td>
<td>Vibro Acoustics</td>
<td>8.0</td>
<td>Second cycle</td>
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<td>SD2155</td>
<td>Flow Acoustics</td>
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<td>Second cycle</td>
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</table>

**Conditionally elective courses**

<table>
<thead>
<tr>
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<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD1116</td>
<td>Design of Silent and Vibration-free Products</td>
<td>6.0</td>
<td>First cycle</td>
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<tr>
<td>SD1120</td>
<td>Noise and Vibration Control</td>
<td>9.0</td>
<td>First cycle</td>
</tr>
<tr>
<td>SD2111</td>
<td>Engineering Acoustics</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>SD2125</td>
<td>Signals and Mechanical Systems</td>
<td>6.0</td>
<td>Second cycle</td>
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</table>

**Recommended courses**

<table>
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<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
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<tbody>
<tr>
<td>SE2123</td>
<td>Testing Techniques in Solid Mechanics</td>
<td>6.0</td>
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</tr>
<tr>
<td>SE2860</td>
<td>FEM Modelling</td>
<td>8.0</td>
<td>Second cycle</td>
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<tr>
<td>SG2211</td>
<td>Vehicle Aerodynamics</td>
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</tr>
<tr>
<td>SG2215</td>
<td>Compressible Flow</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>
**Supplementary information**

*SD1116, SD1120, SD2111 and SD2125 are basic courses. For students who has not studied corresponding course before, one has to be studied.

At least one of the recommended courses under year one and two has to be studied.

**Year 2**

**Recommended courses**

<table>
<thead>
<tr>
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<th>Course name</th>
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<tbody>
<tr>
<td>SD2166</td>
<td>Building Acoustics and Community Noise</td>
<td>7.5</td>
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<tr>
<td>SE2126</td>
<td>Material Mechanics</td>
<td>9.0</td>
<td>Second cycle</td>
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<tr>
<td>SE2132</td>
<td>Applied Elasticity with FEM</td>
<td>9.0</td>
<td>Second cycle</td>
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</tbody>
</table>

**Supplementary information**

At least one of the recommended courses under year one and two has to be studied.
Appendix 2: Specialisations

Master's Programme, Engineering Mechanics, 120 credits (TTEMM), Programme syllabus for studies starting in autumn 2017

**Track, Fluid Mechanics (TEMA)**

Mechanics of solids, fluids and gases are fundamental areas within classical physics and plays a pivotal role in the design and analysis in almost every branch of engineering science. Today, this position is enhanced by even larger amount of the areas engulfed by the subject. For instance, chemical and material sciences in combination with fluid mechanics lead to a deeper understanding of various physical phenomena and also lead to new technical innovations. The courses in fluid mechanics, turbulence, compressible flow, computational fluid dynamics and vehicle aerodynamics provide a stable platform for solving complex fluid mechanics problems in industry or performing research towards a PhD. The Fluid Physics and Applied Fluid Mechanics Laboratory is a part of the Department of Mechanics where both experimental and computational projects of various fluid dynamical systems are carried out. The Linné FLOW Centre is an environment for fundamental research in fluid mechanics, with research projects integrating experiments, computations and theory and combining expertise in stability and transition, flow control, turbulence and geophysical flows, micro-fluid flows, multiphase flows, aero-acoustics and numerical analysis.

**Track, Solid Mechanics (TEMB)**

Solid Mechanics can be seen as a link between material science and applied mechanics with more focus on the latter. Solid Mechanics deals with the mechanical behaviour of materials and structures. The research at the Department of Solid Mechanics covers computational, fracture, composite, contact, material, bio and paper mechanics as well as reliability and fatigue. A primary goal of this research is to develop methods for reliable design of structures, material systems and processes. The Department of Solid Mechanics is host for the Biofibre Material (BiMaC) Excellence Centre and the Forest Products Industry Research College (FPIRC). The research within the field of solid mechanics at the Department of Mechanics is focused on the behavior biomechanical systems. The track in Solid Mechanics is composed of fundamental and advanced courses.

**Track, Sound and Vibrations (TEMC)**

Noise and vibration are important issues in modern society. Applications of technical acoustics cover an extremely wide field, from applied mathematics and mechanics to measuring techniques plus signal processing down to motors, transport and building technology. The Marcus Wallenberg Laboratory for Sound and Vibration Research (MWL) is a part of the Department of Aeronautical and Vehicle Engineering and is the largest university centre in northern Europe in the area of sound and vibration research. The track in Sound and Vibration introduces acoustics as an integrated element of engineering with a particular bearing on mechanics, fluid dynamics and solid mechanics. The contents of the courses cover a wide area within sound and vibration control. Included are fundamental principles on sound and vibration generation, transmission and reduction in complex structures, with coupling between vibrating structures and surrounding media, such as gases and liquids.