Programme syllabus

Master's Programme, Sustainable Technology, 120 credits
Masterprogram, teknik och hållbar utveckling
120.0 credits

Valid for students admitted to the education from autumn 14 (HT - Autumn term; VT - Spring term).

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

Programme objectives

The information is valid for students starting 2014-2015. There could be changes in year 2 – please check http://www.kth.se/en/studies for information about the latest study plan.

Beyond the objectives which are specified in the Higher Education Degree Ordinance, there are also specific goals for this programme. A graduate from the programme must:

Knowledge and understanding

- Have a broad scientific and system based knowledge and understanding within the area of Sustainable Development, with a specialisation in Industrial Ecology, including society’s effects on the world’s ecosystems and an understanding of today’s global societal challenges.

- Have fundamental knowledge about, and understanding of, strategies and tools to work with technology and sustainable development within a number of industry areas, for example: sustainability analysis, scenario studies, environmental management, environmental consequences, waste management, environmental engineering, and environmental system analyses.

Skills and abilities

- Possess the ability to analyse and formulate the role of technology’s in sustainable development

- Possess a good ability to analyse and validate societal challenges for sustainable development

- Be able to implement strategies and tools used within the knowledge area “Industrial Ecology”

- Possess the ability to critically analyse, formulate, and handle an environmental problem from a systems perspective

- Understand the importance of the social dimension in sustainable development

- Independently, as well as in a group, be able to apply knowledge and abilities in a practical context, with regards to relevant scientific, professional and job-related aspects, and social judgments and approaches

- Be able to communicate, orally and in writing, one’s own completed work

- Altogether be able to contribute to improved socio-technical system solutions leading to increased resource efficiency and improved material cycles
Ability to make judgements and adopt a standpoint

- Have a good understanding that the engineering-problems in areas of sustainable development and Industrial Ecology are often complex, value based and can sometimes contain contradictions
- Be aware of private responsibility and the ethical standpoints which can occur in working with sustainable development

KTH’s local degree ordinance can be found in KTH’s guidelines, www.kth.se.

Extent and content of the programme

The programme consists of 120 credits which correspond to two years full time study. The programme is primarily on the second level. The programme consists of compulsory and conditionally elective courses divided depending on entrance.

The language of instruction for the programme is English. Certain courses are also offered in Swedish.

Eligibility and selection

Basic requirements

In order to be eligible for the Master’s programme, a relevant higher education degree, technical Bachelor degree, or other corresponding technical, natural or other science degree relevant for the programme in the first cycle, comprising 180 higher education credits is required.

Other studies or work experiences are assessed based on the competence referred to.

Special requirements

No special requirements

Selection into the programme

Selection into the programme is based on an evaluation of the following criteria: University/higher education institution, grades, proposal for degree project, courses relevant to the programme, personal letter, work experience and references.

For more information, refer to KTH’s degree ordinance which can be found in KTH’s guidelines, www.kth.se

Implementation of the education

Structure of the education

The study year comprises 40 weeks and is divided into two terms, autumn and spring term. Each term comprises two study periods. Study years, terms, and study periods are described in KTH’s guidelines, www.kth.se

Structure of the education

The programme’s first three terms consist of theoretical courses, some of which are compulsory for all students. The studies are, to a large extent, project-based work and case studies which means that a large focus will be on training, communication, critical thinking, and oral and written presentations. The courses are linked to practical knowledge through collaboration with different companies and authorities. The programme concludes with a degree project in the fourth term.
Courses
The programme is course-based. Lists of courses are included 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.

Conditions for participation in the programme
Course registration
The student registers courses before each term according to KTH’s central guidelines on “Personal Menue” on www.kth.se, between the 1st and 15th of November and the 1st and 15th of May, respectively or through the study counsellor. When cancelling a course the student should notify the course giving department.

Term enrolment
A condition in order to participate in the studies is that the student, each spring and autumn must enrol for the coming term. This is done through “Personal Menue” on www.kth.se.

By completing the term enrolment, the student has confirmed their intention to study and participate in the programme.

Conditions for participation in the lectures
For studies in study year 2:

At least 45 higher education credits must be completed from study year 1 by the end of the examination period in August. Students who have not fulfilled this requirement must, in collaboration with a study adviser, create an individual study plan. The main intent with the individual study plan is that the student will complete the remaining elements during the next coming study year. In the study plan, the remaining elements should be included as well as suitable courses from the next study year. Special consideration should be given to the courses’ prerequisites.

Recognition of previous academic studies
Students have the possibility to apply for recognition of previous academic studies from course(s) at another higher education institution or university, both national and international.

KTH’s entire policy for recognition of previous academic studies can be found in KTH’s guidelines: Policy on credit transfer

Studies abroad
Inside the programme possibilities for studies abroad are offered.

To be eligible for studying abroad inside the frames of an exchange programme, the student should be registered at KTH, have at least two years of University studies prior to departure and be in tune with their studies.

Degree project
The degree project is a course compromising 30 ECTS meaning it should cover 20 weeks full time studies. The thesis work should not include other courses (with own course codes).
Generally, a larger portion of the studies must be completed before the degree project can be started. At least 60 ECTS should be completed whereof 30 ECTS on advanced level inside the main area of study.

The thesis work is graded A-F based on KTH’s Evaluation criteria.

KTH’s rules for the degree project for the Master’s degree can be found in the KTH Guidelines: Degree projects.

**Degree**

In order to earn Degree of Master of Science (Two Years), 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:

- At least 103 ECTS on advanced level of the masters programmes compulsory and conditional elective courses (including a degree project consisting of 30 ECTS)
- A maximum of 17 ECTS elective courses

For engineering programmes coupled to the master programme examination requirements for the engineering programme should also be fulfilled.

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

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

Master's Programme, Sustainable Technology, 120 credits (TSUTM), Programme syllabus for studies starting in autumn 2014

General courses

Year 1

Mandatory courses (22.5 credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL2181</td>
<td>Environmental System Analysis and Decision-making</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MJ2615</td>
<td>Introduction to Industrial Ecology, larger course</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MJ2659</td>
<td>Technology and Ecosystems, Larger Course</td>
<td>7.5</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>AL2130</td>
<td>Waste Management</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AL2140</td>
<td>Cleaner Production</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AL2156</td>
<td>Applied Ecology</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AL2160</td>
<td>Environmental Management</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AL2161</td>
<td>Environmental Management II, Advanced Course entry requirements AL2160</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AL2190</td>
<td>Ecological Economics</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AL2191</td>
<td>Technology and Sustainable Development</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MJ2685</td>
<td>Smart Cities and Climate Mitigation Strategies- Project Based</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

Supplementary information

The Master Program Sustainable Technology, TSUTM, has three routes of entry as below;
* Input for the international and KTH external students, "direct entrance"
* Input from the Degree Programme in Energy and Environment (CENMI)
* Input from ITM school’s Degree Programs in: Design and Product Realisation (CDEPR), Mechanical Engineering (CMAST), Materials Design and Engineering (CMATD)
Note!

* At least four of the Conditionally Elective courses must be chosen in Year 1.

* At least six of the Conditionally Elective courses must be chosen in year 1 and 2, which two of the courses AL2161, MJ2641 or MJ2681 have to be included for a Degree.

### Year 2

**Mandatory courses (43.5 credits)**

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL2101</td>
<td>Applied Industrial Ecology</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AL227X</td>
<td>Degree Project in Industrial Ecology, Second Cycle</td>
<td>30.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td></td>
<td><em>This course can be replaced by MJ273X with grading scale A to F</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MJ2673</td>
<td>Research Methodology and Theory of Science</td>
<td>7.5</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>AL2135</td>
<td>Environmental Modelling: Introduction with Application Examples</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MJ2641</td>
<td>Cleaner Production II</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>MJ2681</td>
<td>Applied Environmental Systems Analysis II</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

**Supplementary information**

KTH’s president has decided that starting 2015-07-01, the grades of pass (P) and fail (F) shall be used for degree projects. Students who began their studies between 2007-07-01 and 2015-06-30 may apply to conduct their degree projects under the grading scale A-F. Such an application shall be made prior to registration in a degree project course, and prior to starting the course.

The Master Program Sustainable Technology, TSUTM, has three routes of entry as below:

* Input for the international and KTH external students, "direct entrance"
* Input from the Degree Programme in Energy and Environment (CENMI)
* Input from ITM school’s Degree Programs in: Design and Product Realisation (CDEPR), Mechanical Engineering (CMAST), Materials Design and Engineering (CMATD)

Note!

At least six of the Conditionally Elective courses must be chosen in year 1 and 2, which two of the courses AL2161, MJ2641 or MJ2681 have to be included for a Degree.

**Recommended elective courses for transitional programme CENMI** is as follows:

- MJ2695 Sustainable development in developing countrie, 6.0 ECTS
- AG2800 Life Cycle Assessment, 7.5 ECTS
- MJ2413 Energy and Environment, 6.0 ECTS
MJ2407 Sustainable Energy Utilisation, 9.0 ECTS

MJ2405 Sustainable Power Generation, 9.0 ECTS
Appendix 2: Specialisations

Master's Programme, Sustainable Technology, 120 credits (TSUTM), Programme syllabus for studies starting in autumn 2014

This programme has no specialisations.