



# Programme syllabus

[An accessible version of the syllabus can be found in the Course and programme directory.](#)

## Master's Programme, Sustainable Energy Engineering 120 credits

Masterprogram, hållbar energiteknik

*Valid for students admitted to the education from autumn 10 (HT - Autumn term; VT - Spring term).*

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

### Programme objectives

Beyond the goals which are specified by the Higher Degree ordinance, there are also specific goals for this programme.

A graduate from the programme must:

#### Knowledge and understanding

- Have a broad technical scientific foundation in order to work within the areas of energy technology. This should include knowledge about today's and the future's systems which are

applicable to environmental affects, energy sources and related to industry and renewable energy processes

- Show a broad knowledge within these technical areas, including knowledge in mathematics and natural sciences as well as essential focus knowledges within certain portions of this area

## Skills and abilities

- Show a good ability to utilise theories, individually and in groups, in practical situations with regards to technical and natural scientific aspects and with regards taken to relevant scientific, professional and social judgements and approaches
- show a good ability to analyse, formulate and handle technical problems from a system perspective, with an overview of their life-cycle, from idea/need to specification, development, maintenance, and termination and the ability to delimit, decide resources, needs and lead processes for problem solving and realisation
- Possess individual and professional abilities such as language, leadership, project management and communication for work as an engineer in a leading position or as a leader in a technology-intensive company, or in order to be able to continue towards a research career

## Ability to make judgements and adopt a standpoint

- have especially good understanding that engineering-problems are often complex, can be incompletely defined and sometimes contain contradictions
- Be aware about the responsibility and the ethical standpoints which can occur in relation to different technical, organisational, economical, ecological and social organisations

KTH's local degree ordinance can be found in KTH's guidelines [intra.kth.se/regelverk](http://intra.kth.se/regelverk)

## Extent and content of the programme

The programme comprises 120 higher education credits which correspond to two years of full-time study. The programme is primarily in the second cycle.

Selectable tracks within Sustainable Energy Engineering are:

- Energy Usage
- Power Production
- Solar energy, is given in collaboration with HDa

The language of instruction is entirely English.

The programme can, in its entirety, be taken entirely from a distance. The prerequisites are that the student attends one of the partner universities below:

Makerere University, Uganda

Bahir Dar University, Ethiopia

Mekelle University, Ethiopia

Addis Ababa University, Ethiopia

University of Zambia, Zambia

University Eduardo Mondlane, Mozambique

University of Dar es Salaam, Tanzania

Kigali Institute of Science and Technology, Rwanda

University of Mauritius, Mauritius

International College of Business and Technology, Sri Lanka

Open University of Sri Lanka, Sri Lanka

GE Infrastructure, Mexico

## Eligibility and selection

In order to be eligible for the Master's programme, a relevant higher education, Bachelor of Science in Engineering or technical bachelor, degree preferably within Mechanical Engineering or Chemical Engineering comprising 180 higher education credits is required.

Other, corresponding, degrees within natural science in the first cycle can also provide eligibility provided that the relevant courses in technical thermodynamics, fluid mechanics, or heat transfer have been fulfilled. Other studies or work experiences are judged by competencies referred to. For KTH's programmes with English as the language of instruction, there is a special requirement of English B or the corresponding knowledge.

This knowledge can be judged as not completed if:

1. The grade point average is in the lower third of the used grading scale
2. The university/institution where the degree is completed is regarded by the local authorities as an unacceptable quality standard of education
3. The degree is not deemed sufficient for admission to a master's programme in the country which it was received

Other studies or work experiences are judged on the basis of the competence referred to.

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

For more information, refer to KTH's degree ordinance which can be found in KTH's guidelines, [www.kth.se](http://www.kth.se)

# Implementation of the education

## Structure of the education

Study years, terms, and study periods are described in KTH's guidelines, [www.kth.se](http://www.kth.se)

### **Structure of the education**

The programme starts with a common course package which provides a solid foundation for the three tracs: Power Production, Energy Usage, and Solar Energy - which are given primarily during term 2. The third term comprises continuation studies within the energy area with a research-preparing perspective. The programme is concluded with a degree project during term 4.

## 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

### **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 "Mina sidor", between the 1st and 15th of November and the 1st and 15th of May, respectively.

By completing term enrolment, the students have confirmed their intention to study and participate in the programme. Only after that may the student be able to:

- Register for the term

- Register for courses
- Get results reported

### **Course selection**

The student select courses before each term according to KTH's central guidelines

### **Selection of track**

Choice of track is done in the form of enrolment to the respective courses before the start of term 2. There is no limitation on the number of places available in the specialisation.

### **Conditions for participation in the courses**

#### ***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, [www.kth.se](http://www.kth.se)

## **Studies abroad**

There exists a number of possibilities to study abroad within the programme, for example between study year 1 and 2 or during the degree project. Certain exchanges can occur with the help of scholarships, for example Minor Field Studies.

## **Degree project**

KTH's rules for the degree project can be found in KTH's guidelines, [www.kth.se](http://www.kth.se). Generally, a large portion of the studies must be completed before the degree project can be started.

# Degree

In order to earn Degree of Master of Science in Mechanical Engineering (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 a degree project consisting of 30 higher education credits, in the second cycle.

KTH's local degree ordinance can be found at <http://intra.kth.se/regelverk/>

Appendix 1 - Course list

Appendix 2 - Programme syllabus descriptions



# Appendix 1: Course list

## Master's Programme, Sustainable Energy Engineering (TSUEM)

### General courses

Year 1

### Mandatory courses (45.0 Credits)

Code	Name	Credits	Edu. level
<a href="#">MJ1402</a>	Introduction to Energy Technology	3.0 hp	First cycle
<a href="#">MJ2405</a>	Sustainable Power Generation	9.0 hp	Second cycle
<a href="#">MJ2407</a>	Sustainable Energy Utilisation	9.0 hp	Second cycle
<a href="#">MJ2410</a>	Energy Management	6.0 hp	Second cycle
<a href="#">MJ2411</a>	Renewable Energy Technology	6.0 hp	Second cycle
<a href="#">MJ2413</a>	Energy and Environment	6.0 hp	Second cycle
<a href="#">MJ2424</a>	Computational Methods in Energy Technology	6.0 hp	Second cycle

## Conditionally elective courses

Code	Name	Credits	Edu. level
<a href="#">MJ2412</a>	Renewable Energy Technology, Advanced Course <i>Track: Power Generation</i>	6.0 hp	Second cycle
<a href="#">MJ2422</a>	Thermal Comfort and Indoor Climate <i>Track: Energy Utilization</i>	6.0 hp	Second cycle
<a href="#">MJ2423</a>	Applied Refrigeration and Heat Pump Technology <i>Track: Energy Utilization</i>	6.0 hp	Second cycle
<a href="#">MJ2426</a>	Applied Heat and Power Technology <i>Track: Power Generation</i>	6.0 hp	Second cycle

## Year 2

### Mandatory courses (16.5 Credits)

Code	Name	Credits	Edu. level
<a href="#">AK2030</a>	Theory and Methodology of Science (Natural and Technological Science)	4.5 hp	Second cycle
<a href="#">MJ2409</a>	Applied Energy Technology, Project Course	9.0 hp	Second cycle
<a href="#">MJ2440</a>	Measurement Techniques	3.0 hp	Second cycle





# Appendix 2: Specialisations

## Master's Programme, Sustainable Energy Engineering (TSUEM)

This programme has no specialisations.