



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 13 (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 in depth knowledges within certain parts of this area

Skills and abilities

- Show a good ability to utilise theories, both 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, needed 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, www.kth.se.

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.

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. There is a special requirement of English B or the corresponding knowledge. Other studies or work experiences are judged by competencies referred to. This knowledge can be judged as not complete 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

Implementation of the education

Structure of the education

Study years, terms, and study periods are described in KTH's guidelines, www.kth.se

Structure of the education

The programme starts with a common course package which provides a solid foundation for the four tracks: Power Production, Energy Usage, Nuclear engineering 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

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.

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 KTH's website, www.kth.se.

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 (51.0 Credits)

Code	Name	Credits	Edu. level
MJ1402	Introduction to Energy Technology <i>Can not be chosen by Master of science Engineering</i>	3.0 hp	First cycle
MJ2405	Sustainable Power Generation	9.0 hp	Second cycle
MJ2407	Sustainable Energy Utilisation	9.0 hp	Second cycle
MJ2410	Energy Management	6.0 hp	Second cycle
MJ2411	Renewable Energy Technology <i>Conditionally Elective for MSc E, two courses must be chosen</i>	6.0 hp	Second cycle
MJ2413	Energy and Environment <i>Conditionally Elective for MSc E, two courses must be chosen</i>	6.0 hp	Second cycle
MJ2424	Computational Methods in Energy Technology	6.0 hp	Second cycle
MJ2429	Turbomachinery <i>Conditionally Elective for MSc E, two courses must be chosen</i>	6.0 hp	Second cycle

Conditionally elective courses

Code	Name	Credits	Edu. level
MJ2412	Renewable Energy Technology, Advanced Course <i>Power Generation</i>	6.0 hp	Second cycle
MJ2422	Thermal Comfort and Indoor Climate <i>Energy Consumption</i>	6.0 hp	Second cycle
MJ2423	Applied Refrigeration and Heat Pump Technology <i>Energy Consumption</i>	6.0 hp	Second cycle
MJ2426	Applied Heat and Power Technology <i>Power Generation</i>	6.0 hp	Second cycle

Supplementary information

One profiles must be chosen,
Energy Consumption,
Power Generation,
Solar Energy (given at Högskolan Dalarna)

MSc E: Two of this courses must be chosen MJ2411, MJ2413, MJ2429

Courses: MJ2405, MJ2407, MJ2424, MJ2410 are compulsory for MSc E.

Year 2

Mandatory courses (18.0 Credits)

Code	Name	Credits	Edu. level
MJ2409	Applied Energy Technology, Project Course	9.0 hp	Second cycle
MJ2440	Measurement Techniques	3.0 hp	Second cycle
MJ2475	Theory and Methodology of Science for Energy Research	6.0 hp	Second cycle

Recommended courses

Code	Name	Credits	Edu. level
MJ2420	Combustion Theory	6.0 hp	Second cycle
MJ2425	Cooling of Electronics	6.0 hp	Second cycle
MJ2429	Turbomachinery	6.0 hp	Second cycle
MJ2434	Advanced Refrigeration and Heat Pump Technology	6.0 hp	Second cycle
MJ2460	Green Building - Concept, Design, Construction and Operation	6.0 hp	Second cycle
MJ2462	Achieving Energy Efficiency in Existing Buildings	6.0 hp	Second cycle

Supplementary information

One profiles must be chosen,
Energy Consumption,
Power Generation,

Solar Energy (given at Högskolan Dalarna) compulsory courses MÖ3030, MÖ3025 och MÖ4001

MSc E: Two of this courses must be chosen MJ2411, MJ2413, MJ2429

Courses: MJ2405, MJ2407, MJ2424, MJ2410 are compulsory for MSc E.



Appendix 2: Specialisations

Master's Programme, Sustainable Energy Engineering (TSUEM)

This programme has no specialisations.