Programme Regulations 2007
of the Master's degree programme in
Energy Science and Technology

Departments of
Information Technology and Electrical Engineering\(^1\) (D-ITET)
and
Mechanical and Process Engineering (D-MAVT)

7 May 2007\(^2\)

*This is an English translation only. The original German version is the legally binding document.*

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### Version: 16.11.2010 – 3

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\(^1\) Department in charge

\(^2\) With changes pursuant to the Executive Board resolution of 17.06.2008, 31.08.2010 and 16.11.2010. This version of the Programme Regulations (16.11.2010 – 3) replaces the previous version (31.08.2010 – 2).
Programme Regulations 2007 of the Master's degree programme in Energy Science and Technology
Departments of Information Technology and Electrical Engineering and Mechanical and Process Engineering

7 May 2007 (Version: 16 November 2010)

This is an English translation only. The original German version is the legally binding document.

The ETH Zurich Executive Board,
pursuant to Art. 4, Para. 1, Subpara. a of the ETH Zurich Organisational Ordinance (Organisationsverordnung ETH Zürich) of 16 December 2003,^{3}
decrees:

Chapter 1: General regulations

Part 1: General

Art. 1 Subject and scope, Appendix

1 These Programme Regulations set out the requirements according to which the Master's degree in Energy Science and Technology at the ETH Zurich Departments of Information Technology and Electrical Engineering (D-ITET) and Mechanical and Process Engineering (D-MAVT) may be acquired.

2 D-ITET and D-MAVT are joint sponsors of the Master's degree programme in Energy Science and Technology (MEST). D-ITET is in charge of the programme.

3 The Appendix is a part of these Programme Regulations. Any changes to the Appendix are subject to the approval of the Rector, on the request of or in consultation with D-ITET and D-MAVT.

Art. 2 Academic title

1 Graduates of the ETH Zurich Master's degree programme in Energy Science and Technology are awarded the academic title

   Master of Science ETH in Energy Science and Technology
   (abbreviation: MSc ETH EST)

2 This title may also be used in the abbreviated form 'MSc ETH'.

^{3} RSETHZ 201.021
Art. 3  Limitation on the number of programme places

The number of places on the programme is limited. D-ITET, in consultation with D-MAVT, determines and publicises the number of programme places available each year for new students.

Art. 4  Legal basis

These Programme Regulations are based upon the stipulations set out in the following legal documents:

a. General Ordinance on Performance Assessments at ETH Zurich (*Allgemeine Verordnung über Leistungskontrollen an der Eidgenössischen Technischen Hochschule Zürich*; hereafter AVL ETHZ) of 10 September 2002

b. Ordinance on Admission to Studying at ETH Zurich (*Verordnung über die Zulassung zu den Studien an der Eidgenössischen Technischen Hochschule Zürich*) of 10 September 2002

Art. 5  Course Catalogue

D-ITET, in consultation with D-MAVT, lists the course units of the degree programme in the Course Catalogue. This list is binding. Details are set out in Art. 28 of the General Ordinance on Performance Assessments at ETH Zurich (*Allgemeine Verordnung über Leistungskontrollen an der Eidgenössischen Technischen Hochschule Zürich*) and in the relevant directives.

Art. 6  Language of instruction

1 Course units and the corresponding performance assessments are normally conducted in English. The language of instruction is subject to the pertaining Rector’s directives.

2 Rescinded

3 Rescinded

Art. 7  Admissions committee

In consultation with D-MAVT D-ITET selects the members of the MEST admissions committee, who serve for one year. Reappointment is permitted. The tasks of the admissions committee are set out Art. 23.
Part 2: Credit system

Art. 8 Policy

1 The degree programme follows a credit system which is aligned with the European Credit Transfer System (ECTS).

2 ETH Zurich deploys the ECTS in accordance with the Credit System Guidelines (Richtlinien zum Kreditsystem). \(^8\)

Art. 9 Credits, basis for calculation

1 Credits describe the average time expenditure required to accrue a study attainment.

2 The workload is designed such that full-time students may obtain an average of 60 credits per year. This workload comprises all of the study-related activities required to obtain credits.

Art. 10 Allocation of credits

1 D-ITET and D-MAVT allocate a certain number of credits to each course unit they offer and publish these in the Course Catalogue.

2 If an ETH Zurich course unit is found on the curriculum of more than one ETH Zurich degree programme, the department offering the course unit assigns it a standard number of credits in consultation with those integrating it into a programme. The Rector settles any cases of disagreement.

Art. 11 Issuing of credits

1 Credits are issued for satisfactory performance. Performance is considered satisfactory if it has been awarded a grade of at least a 4, or a ‘pass’.

2 No credits are issued for unsatisfactory performance.

3 The full number of credits are always issued if the prerequisites of Para. 1 have been satisfied. Partial issue of credits is not permitted.

4 The number of credits issued is that number published in the Course Catalogue valid at the time the respective performance assessment was undertaken.

\(^8\) See www.rektorat.ethz.ch/directives.
Art. 12  Recording, checking, registration

D-ITET records, checks and registers the credits acquired.

Chapter 2:  Content, structure and scope of the Master’s degree programme

Part 1:  Content, structure and scope

Art. 13  Programme content, structure

1 Energy is a genuinely interdisciplinary area. The Master’s degree in Energy Science and Technology (MEST) accordingly involves science and technology from areas of electrical engineering, mechanical engineering, environmental sciences, economics and other disciplines. The goal of the degree programme is to illuminate the complexity and interdisciplinarity of energy issues and to cover methods and approaches appropriate to this from various disciplines.

The Master’s degree programme comprises compulsory and elective core subjects (energy-specific courses), a research project, a six-month Master’s thesis and an internship in industry. The research project and the Master’s thesis provide students with experience in conducting research projects, and the internship gives them practical experience of the professional world. The Master’s degree prepares the student for doctoral work or for entry to the labour market.

2 The content of each student’s programme curriculum is overseen and coordinated by a professor designated as ‘tutor’. Details of the tutoring system are set out in Art. 16.

Art. 14  Commencing the programme

Students normally enter the MEST programme at the beginning of the Autumn Semester. Entry at the beginning of the Spring Semester requires the permission of the admissions committee.

Art. 15  Scope, duration, limits on duration of studies

1 As stipulated in Art. 38, 90 credits are required to obtain a Master’s degree. At least 60 of the required 90 credits must be acquired at ETH Zurich. Exceptions are listed in Art. 19, Para. 2.
2 The normal duration of the degree programme is one and a half years.

3 The maximum permitted duration of studies is three years. The Rector may extend this if cogent grounds are given.

4 If admission to the degree programme is granted subject to the acquisition of additional credits the maximum permitted duration of studies may be extended by half a year for required extra credits in the range of 21 – 30 and by one year for required extra credits in the range of 31 – 60. For fewer than 21 required extra credits no extension is granted.

Art. 16 Tutoring system, individual study plan

1 The degree programme is a tutor-led programme (see www.master-energy.ethz.ch).

2 When applying for the MEST programme students must submit at least three choices of tutor, in order of preference. A tutor is assigned to each student when admission is granted.

3 The designated tutor may on request provide information regarding the admission to the admissions committee (see Art. 23).

4 The tutor, in consultation with the student, determines an individual curriculum which takes into account all the core courses compulsory for the student (see Para. 4i). This curriculum should guarantee a solid, varied educational foundation and at the same time take into account the student’s talents and expectations. The tutor also supervises the student during the entire Master’s degree programme, keeping track of his/her progress and providing guidance when necessary.

4i The admissions committee decides which core courses are compulsory for each individual student.

5 Any student who wishes to change his/her tutor should submit a well-grounded request to the Director of Studies. The Director of Studies may, on cogent grounds, deny the request. A change of tutor is also subject to the following:

a. Changes are only possible at the beginning of a semester.

b. A change does not entitle the student in question to an extension of the maximum permitted duration of studies.

c. Disagreements between the Director of Studies and the student are settled by the Rector of ETH Zurich.
**Art. 17** Study Guide

1 In cooperation with the tutors, D-ITET compiles a Study Guide to the degree programme which includes an overview of degree programme procedures and recommendations thereto.

2 Questions regarding student exchange may be referred to the mobility advisor of D-ITET. Further details are given in Art. 19.

**Art. 18** Recognition of study achievements acquired outside the Master’s degree programme

The Director of Studies of D-ITET, in consultation with the responsible tutor, makes the final decision on recognition of study achievements acquired in other ETH Zurich study programmes or at other universities (e.g. via an exchange programme) during the Master’s degree programme. Performance evaluations are handled in accordance with Art. 12, AVL ETHZ\(^9\).

**Art. 19** Student exchange (outgoing students)

1 During the Master’s degree programme credits may be acquired at other universities (mobility credits). Of these a maximum of 30 may be counted towards the Master’s degree. Surplus or not recognised mobility credits are listed on a separate sheet of the academic record at the request of the student.

2 Credits acquired at EPF Lausanne or the Universities of Zurich or St. Gallen in the category ‘multidisciplinary courses’ do not qualify as mobility credits (see Art. 34, Para. 1).

3 Before a period of student exchange the respective student, with the help of the tutor, draws up a written study plan which includes the credits to be acquired at the host university. The Director of Studies of D-ITET is informed of this study plan.

\(^{9}\) SR 414.135.1, RSETHZ 322.021
Part 2: Fields of study and grouping by category

Art. 20  Grouping by category

1 To obtain a Master's degree study achievements are required in the following categories. The minimum number of credits required in each category is set out in Art. 38.
   a. Core courses
      1. Compulsory core courses
      2. Elective core courses
   b. Multidisciplinary courses
   c. Compulsory electives in humanities, social and political sciences
   d. Semester project
   e. Internship in industry
   f. Master's thesis

2 D-ITET, in consultation with D-MAVT, assigns course units to the categories in Para. 1 and publishes them in the Course Catalogue.

Art. 21  Overview of categories

1 Core courses: Core courses cover detailed knowledge in core areas of energy science and are the foundation of the Master's degree programme. A differentiation is made between compulsory and elective core courses. Compulsory core courses are determined individually for each student by the admissions committee. Elective core courses are determined by the tutor in consultation with the respective student. Details regarding performance assessments are given in Art. 33.

2 Multidisciplinary courses: Multidisciplinary enable the student to deepen degree-specific knowledge or extend knowledge in areas of economics and the humanities. The tutor helps the student to select multidisciplinary courses. Further details, e.g. regarding performance assessments, are given in Art. 34.

3 Compulsory electives in humanities, social and political sciences: Students are required to select general course units from the offering of electives in humanities, social and political sciences (compulsory GESS electives). Further details are provided in the directives regarding compulsory GESS electives and in Art. 34 of these Programme Regulations.
Semester project: In the semester project the student deploys the subject and social skills acquired to gain experience of solving a technical problem independently. Further details are given in Art. 35.

Internship in industry: Students are required to complete an internship in industry lasting at least 12 weeks. The goal of the internship is to familiarise students with the industrial work environment. Here they have the opportunity to get involved in the current projects of the respective institution. Further details are given in Art. 36.

Master's thesis: The Master’s thesis concludes the degree programme. With the Master’s thesis students demonstrate their ability to produce independent, structured scientific work. Further details are given in Art. 37.

Chapter 3: Admission to the Master’s degree programme

Art. 22 Prerequisites for admission

1 Persons may apply for the degree programme who hold a Bachelor’s degree comprising at least 180 ECTS credits or an equivalent degree from a university or a Swiss university of applied sciences in a discipline which qualifies them for the degree programme. Qualifying disciplines are listed in the Appendix.

2 Details of the academic, language and performance prerequisites for admission (profile of requirements) are provided in the Appendix.

Art. 23 Application, admission procedure and entry to the Master’s degree programme

1 All interested parties should apply to the ETH Zurich Rectorate for admission to the degree programme.

2 The MEST admissions committee investigates candidates’ academic backgrounds and suitability for the Master’s degree programme and submits a recommendation for admission/rejection to the Director of Studies of D-ITET.

10 Version pursuant to the Executive Board resolution of 31.08.2010. It applies to students who enter the degree programme from Autumn Semester 2011 onwards. This chapter was revised (Articles 22 and 23 were revised; articles 24 – 26 were rescinded) following the restatement of the profile of requirements for the degree programme (provided in the Appendix).
3 The Rector decides whether to admit/reject the candidate on the basis of the recommendation of the Director of Studies of D-ITET.

4 The Rector may, depending on the candidate’s qualifications and previous knowledge, make admission conditional upon the acquisition of additional knowledge and competences during the Master’s degree programme (admission with additional requirements).

5 Details regarding application, the admission procedure and entry to the Master’s degree programme are determined by the Rector. They are set out in the Appendix.

Art. 24  Rescinded

Art. 25  Rescinded

Art. 26  Rescinded

Chapter 4: Performance assessments

Part 1: General regulations

Art. 27  Types of performance assessment, performance evaluation

1 The degree programme mainly deploys the following types of performance assessment:
   a. examinations
   b. written reports and assignments
   c. presentations
   d. project results

2 Performance in examinations is graded. Performance in other forms of performance assessment is either graded or evaluated on a pass/fail basis.
Art. 28 Admission to performance assessments

1 Admission to performance assessments may be subject to certain conditions. Unless stipulated in these programme regulations, these are listed in the Course Catalogue.

2 D-ITET checks whether the prerequisites for admission to performance assessments have been satisfied.

Art. 29 Rescinded

Art. 30 Registering/deregistering for performance assessments

1 The following applies to registration/deregistration for performance assessments at ETH Zurich:
   a. If the performance assessments in question are end-of-semester examinations or session examinations, registration and deregistration are governed by the stipulations of AVL ETHZ\(^{11}\) and the directives of the Rector.
   b. If the performance assessments fall into another category, registration and deregistration are handled directly by the respective lecturer.

2 If the performance assessments concerned are those of another university, registration and deregistration are subject to the rules of that university.

Art. 30a Absence, interruption, abandonment, late submission or non-submission

The following stipulations apply to absence from, interruption or abandonment of, and late submission or non-submission of performance assessments:

   a. For ETH Zurich performance assessments the stipulations of AVL ETHZ\(^{12}\) and the directives of the Rector apply.
   b. For performance assessments of other universities the rules of the respective university apply.

Art. 31 Rescinded\(^{13}\)

Art. 31a Issuing of results, cases of disagreement

1 Students are informed periodically (via an interim academic record) of their performance results and the number of credits acquired. Every interim academic record documents the performance results and credits accrued since the preceding interim record. Both pass and fail results are included.

2 The procedure in cases of disagreement regarding newly documented results is outlined each time results are issued.

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\(^{11}\) SR 414.135.1, RSETHZ 322.021
\(^{12}\) SR 414.135.1, RSETHZ 322.021
\(^{13}\) Rescinded by the Executive Board resolution of 16.11.2010.
Art. 32  Unethical behaviour

The procedure for dealing with unethical behaviour in the context of performance assessments is detailed in the Disciplinary Code of ETH Zurich (Disziplinarordnung ETH Zürich) of 2 November 2004.¹⁴

Part 2:  Performance assessments in the Master's degree programme

Art. 33  Core courses

¹ The tutor, in consultation with the student, determines an individual curriculum which includes the elective core courses. The compulsory core courses on this curriculum are determined by the admissions committee for each student.

² Every course unit in the category 'core courses' is subject to a performance assessment. The respective mode of each performance assessment is listed in the Course Catalogue. Performance is always graded.

³ A performance assessment is passed if it is awarded a grade of at least a 4.

⁴ A failed performance assessment may be repeated once. A passed performance assessment may not be repeated.

⁵ A student who fails a performance assessment repetition in a compulsory core course will be excluded from the degree programme. D-ITET oversees compliance with these stipulations.

Art. 34  Multidisciplinary courses, compulsory GESS electives

¹ Students may select multidisciplinary courses freely from the entire offering of ETH Zurich, EPF Lausanne, the University of Zurich and the University of St. Gallen. Excepted from this, and not recognised as multidisciplinary courses, are language courses of all levels.

² Every course unit in the categories ‘multidisciplinary courses’ and ‘compulsory GESS electives’ is subject to a performance assessment.

³ The respective mode of each performance assessment is listed in the Course Catalogue if the course unit is offered by ETH Zurich.

⁴ If students attend courses offered by another university they must inform themselves at that university as to the pertaining mode of performance assessment. Students must also ensure that performance results are submitted to D-ITET in writing.

⁵ A performance assessment is passed if it is awarded a grade of at least a 4 or a 'pass'.

¹⁴ SR 414.138.1, RSETHZ 361.1
A failed performance assessment may be repeated once unless the ETH Zurich department or the university offering the respective course unit stipulates otherwise. A passed performance assessment may not be repeated.

**Art. 35  Semester project**

1. The tutor must approve the theme of the semester project and the choice of supervisor.

2. The semester project is supervised by a professor. He/she defines the task to be addressed, sets and puts in writing its starting date, deadline for submission and evaluation criteria, and grades the student's performance.

3. The semester project and the Master's thesis (see Art. 37) are supervised by two different professors. The tutor may grant exceptions if cogent grounds are given.

4. The maximum time allowed for the semester project is seven weeks if it is undertaken full-time. If the semester project is undertaken during the semester it may take up half of the time allotted for full-time studies, i.e. it may last 14 weeks.

5. The semester project is passed if it is awarded a grade of at least a 4.

6. A failed semester project may be repeated once. If it is repeated, a new theme must be addressed. A passed semester project may not be repeated.

7. A student who fails the semester project repetition will be excluded from the degree programme. D-ITET oversees compliance with these stipulations.

**Art. 36  Internship in industry**

1. The internship in industry lasts at least 12 weeks and is normally undertaken in an industrial company (either in Switzerland or abroad). In exceptional cases a research laboratory within or outside of the ETH domain may be selected. The tutor assists the student in choosing a location.

2. The student is responsible for seeing that the institution where the internship takes place provides a written confirmation of the internship.
Performance in the industry internship is evaluated on a pass/fail basis. The assessment is made according to the internship confirmation mentioned in Para. 2.

A failed internship may be repeated once.

Further details regarding the internship in industry may be found in the corresponding D-ITET guidelines. Said guidelines require the approval of the Rector.

Art. 37 Master's thesis

A student is only permitted to commence the Master's thesis if

a. the Bachelor's degree programme has been completed
b. any additional requirements for admission to the degree programme have been fulfilled
c. the semester project (see Art. 35) and the internship in industry (see Art. 36) have been successfully completed and the corresponding credits have been acquired.

The choice of topic and supervisor for the Master's thesis require the approval of the tutor.

The Master's thesis is supervised by a professor. He/she defines the task to be addressed, puts down the starting date of the Master's thesis project, the deadline for thesis submission and the evaluation criteria in writing, and grades the student's performance.

The Master's thesis and the semester project (see Art. 35) are supervised by two different professors. The tutor may allow exceptions if cogent grounds are given.

The Master's thesis project lasts six months and concludes with a written report and an oral presentation. The Director of Studies may, on request, grant an extension if cogent grounds are given.

The Master's thesis is passed if it is awarded a grade of at least a 4.

A failed Master's thesis project may be repeated once. If it is repeated, a new theme must be addressed. A passed Master's thesis may not be repeated.

A student who fails the Master's thesis repetition will be excluded from the degree programme. D-ITET oversees compliance with these stipulations.
Chapter 5: Issuing of the Master’s degree

Art. 38 Credits by category

1. The 90 credits required for the Master’s degree must be acquired in the following categories in at least the numbers given.

   a. Core courses 36 credits
      1. Compulsory core courses (at least 12 credits)
      2. Elective core courses

   b. Multidisciplinary courses 6 credits

   c. Compulsory GESS electives 2 credits

   d. Semester project 8 credits

   e. Internship in industry 8 credits

   f. Master’s thesis 30 credits

2. Compulsory core courses (see Para. 1, Subpara. a, no. 1) are determined for each student individually. D-ITET is responsible for checking whether said courses have been completed by the student in question.

3. Credits acquired in courses which are offered in both the Bachelor’s and the Master’s degree programmes may be recognised towards the Master’s degree if these credits have not already been counted towards the Bachelor’s degree.

Art. 39 Degree request

1. When they have fulfilled the requirements set out in Art. 38 students may request the issue of the Master’s degree. This request must be submitted within three years of commencing the Master’s degree programme. The Rector may extend this deadline if cogent grounds are given.

2. The request should contain all the performance achievements with pass grades in the categories listed in Art. 38, Para. 1 which are to be listed in the academic record. In each category or sub-category the sum of the minimum number of credits set out in Art. 38, Para. 1 must be acquired.

3. A maximum of 100 credits are recognised towards the Master’s degree. Further credits may be listed on a separate sheet of the academic record at the request of the student.
Art. 40  Interim academic record, final academic record, grade point average

1 Interim academic records are generally issued at the end of examination sessions and document the performance results accrued since the preceding interim record.

2 The final academic record contains
   a. the grades and other performance evaluation indicators (e.g., ‘pass’) listed in the request according to Art. 39, Para. 2 plus the average grade; and
   b. a separate sheet listing any additional admission requirements and (at the student’s request) any additional performance evaluations according to Art. 39, Para. 3.

3 The final grade is calculated as the weighted average of all the grades listed in the request (Art. 39, Para. 2) with the corresponding credits as the weighting factor.

4 D-ITET records, checks and registers the grades and other performance evaluation indicators and issues the academic record.

Art. 41  Degree certificate, Diploma Supplement

1 Students who complete the degree programme receive the degree certificate and the Diploma Supplement.

2 The degree certificate is signed by
   a. the Rector of ETH Zurich
   b. the Department Head of D-ITET
   c. the Department Head of D-MAVT
Chapter 6: Final clauses

Art. 42  
Definitive failure, exclusion from the degree programme

1 The degree programme is regarded as definitively failed if one of the following applies:
   a. The conditions for obtaining the Master's degree (acquisition of the required number of credits for the Master's degree according to the stipulations of Art. 38, or any other conditions) can no longer be satisfied due to failure of performance assessments or failure to respect programme deadlines.\(^{16}\)
   b. In cases of admission with additional requirements said additional requirements have not been fulfilled due to failure of performance assessments or failure to respect the deadlines set for them.

2 Definitive failure results in exclusion from the degree programme.

Art. 43  
Transcript of records for non-graduating students

Students who are excluded from the degree programme or withdraw from it before obtaining the Master’s degree receive a transcript of records which lists all the study achievements generated and evaluated before exclusion or withdrawal.

Art. 44  
Entry into effect

These Programme Regulations enter into effect at the beginning of Autumn Semester 2007. They apply to students who enter the degree programme from that date onwards.

On behalf of the Executive Board
President a.i.: Osterwalder
Delegate: Bretscher

\(^{15}\) Version pursuant to the Executive Board resolution of 16.11.2010. This article was revised following the introduction of new stipulations governing admission with additional requirements.

\(^{16}\) The term ‘programme deadlines’ comprises all deadlines in the degree programme context (e.g., the maximum permitted duration of studies, performance assessment deadlines, registration and de-registration deadlines, individual requirement deadlines, etc.).