



Chemical and Bioengineering

Master of Science ETH

Study guide

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The legal basis for this programme is the «Studienreglement 2018, Ausgabe 17.10.2017, für den Master-Studiengang Chemie- und Bioingenieurwissenschaften». The present study guide provides practical information on the programme. Further sources of information are given in the text and at the end of this brochure. Students are requested to consult the departmental website for up-to-date information.

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1 Study programme

Students with an appropriate Bachelor's degree usually complete their studies in three semesters.

1.1 Categories of course units

In order to obtain the Master's degree students have to acquire a total of 90 credits in the following categories in no more than three years:

Category	Credits
Core subjects	24
Compulsory elective subjects	23
Research project, industry internship, case studies	16
Master's thesis	25
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Actual and detailed information on the courses in the various categories as well as the course schedule can be found in the online course catalogue of ETH (see link on page 8).

1.2 Core subjects

Core subjects areas are «Biochemical Engineering», «Products and Materials», «Process Design», and «Catalysis and Separation». Students have to take at least one course from each area.

1.3 Compulsory elective subjects

Compulsory elective subjects include a broad spectrum of advanced topics in biochemical engineering, environment and energy, systems and process engineering, modeling and simulations and economics and technology management. Students may also take as compulsory elective subjects core subjects as long as they have not taken them as such.

1.4 Research project or industry internship

Students have to carry out a research project or an industry internship in a core subject area or in an elective subject. Students are free to choose the area. The chosen supervisor should be contacted at an early date. (See also section 3.6).

1.5 Case studies in process design

Investigation of an industrial process in a teamwork project with simulation, cost calculations, sensitivity analyses and optimizations.

1.6 Master's thesis

The Master's thesis is carried out under the supervision of a professor in a research group of the Department of Chemistry and Applied Biosciences, usually at the Institute of Chemical and Bioengineering. Students are free to choose the area. The duration of the Master's thesis is 20 weeks. (See also section 3.7).

1.7 Electives in science in perspective (SiP)

All students must collect credits in courses offered by the Department of Humanities, Social and Political Sciences (D-GESS).

2 Credit system

The Master's degree programme uses a credit system which is based on the European Credit Transfer System (ECTS). Credits are a measure for the total labour required from the students to reach the educational goal. Calculations are based on a total of 1500 to 1800 working hours per year, equivalent to 60 credits. Therefore, 1 credit corresponds to 25 to 30 hours of total work.

Credits are allocated after the performance assessment intended for the course has been passed. Upon application by the student the Master's title is awarded when a total of 90 credits is reached.

3 Performance assessments

3.1 General

Credits are allocated after the performance assessment has been passed. A performance assessment not passed can be repeated once. Exams and the Master's thesis are rated with a grade between one (lowest) and six (highest). In order to pass, a grade of four must be achieved. Other performance assessments may also be rated with passed/not passed.

3.2 Forms of performance assessments

Performance assessments are in the form of exams, or of a semester performance. The course catalogue lists for each course the form and mode of the performance assessment. Exams are held in examination sessions during the last weeks of the semester breaks.

3.3 Admission to performance assessments

Admission to the performance assessments normally requires that the Bachelor's studies are completed. Exceptions are specified individually for the various categories below.

3.4 Core subjects

- Performance assessments in this category are in the form of exams.

- At least one exam must be taken in each of the four core subjects areas «Biochemical Engineering», «Products and Materials», «Process Design», and «Catalysis and Separation».
- Students who do not pass an exam in a core subject in two attempts get one further chance with another core subject offered in the same area.
- Students enrolled in the Bachelor's degree programme in chemical engineering of ETH are admitted to examinations in core subjects of the Master's degree programme on condition that they have to acquire no more than 11 credits in the category 'compulsory subjects' for their Bachelor's diploma.
- Students who were admitted to the Master's degree programme with the requirement to acquire credits from the ETH Bachelor's degree programme are admitted to examinations in core subjects on condition that they have to acquire no more than 11 of the additional required credits.

3.5 Compulsory elective subjects

- Performance assessments in this category are in the form of exams.
- Students enrolled in the Bachelor's degree programme in chemical engineering of ETH are admitted to examinations in compulsory elective subjects of the Master's degree programme on condition that they have passed the examination block I and the compulsory lab courses of the ETH Bachelor's degree programme's second year.
- Students who were admitted to the Master's degree programme with the requirement to acquire credits from the corresponding ETH Bachelor's programme are admitted to examinations in compulsory elective subjects on condition that they have to acquire no more than 11 of the additional required credits.

3.6 Research project, industry internship and case studies

- Performance assessments in these categories are based on semester performance. The specific requirements to pass are published by the Department. (See also «Directives for Research Projects»).
- Students enrolled in the Bachelor's degree programme in chemical engineering of ETH are admitted to the research project or industry internship of the Master's degree programme on condition that they have to acquire less than 60 credits for their Bachelor's diploma. (See «Wegleitung für den Bachelor-Studiengang Chemieingenieurwissenschaften», section 2.3).

3.7 Master's thesis

Details on the Master's thesis are laid down in the «Directives for Master's Theses». The Master's thesis cannot be started before the Bachelor's degree programme is completed.

4 Request for degree conferral

When the number of credits in the individual categories as defined in section 3.4 to 3.7 has been acquired students can submit a request for degree conferral via their student portale («myStudies») and the student administration. This has to be done no later than three years after the start of the Master's degree programme. The request must itemize the study achievements which should be listed in the final academic record. The maximum number of credits that can be taken into account is 100.

5 Mobility - External Academic Achievements

External academic achievements are those not acquired from the D-CHAB course offerings (LE 511-/529-/535-. Master's theses, projects and internship have their own rules, see corresponding sections). The director of studies decides on their crediting.

Students *with an ETH Zurich Bachelor's Degree* may spend one semester during their Master's degree programme at another university. A study programme for this semester abroad has to be compiled in advance in cooperation with the mobility advisor of the Department. Credits can be obtained externally in the categories research project, industry internship, compulsory elective subjects, and Master's thesis up to a total maximum of 30 credits.

Students *without an ETH Zurich Bachelor's Degree* are not allowed to participate in exchange programmes of ETH Zurich. Individual mobility is possible but without recognition of examinations/credits. Only a Master's thesis carried out externally can be recognised. Or, if the thesis is done at D-CHAB a maximum of 13 credits in the category electives, research project or industry internship can be recognised from outside of the curriculum (according to the course catalogue) or of D-CHAB.

6 Academic year

Teaching is organized in two semesters of 14 weeks each. The Autumn semester lasts approximately from mid-September until Christmas, the Spring semester approximately from mid-February to the end of May. The academic year begins with the Autumn semester.

Most of the courses in the Master's degree programme, especially lectures, are offered in the Autumn semester. With the consent of the respective supervisors, research project and industry internship may also be available in

the Spring semester and during semester breaks.

7 Documentation

- Study regulation (in German only: Studienreglement 2018, Ausgabe 17.10.2017, für den Master-Studiengang Chemie- und Bioingenieurwissenschaften)
- General Regulations on Performance Assessments at ETH Zürich (in German only: Leistungskontrollenverordnung ETH Zürich)
- Directives concerning compulsory electives in science in perspective (Directive "Science in Perspective" (SiP) programme of the Department of Humanities, Social and Political Sciences (D-GESS))

8 Websites

- Info on the programme: www.chab.ethz.ch/en/studies/master/msc-chemical-and-bioengineering.html
- Department: www.chab.ethz.ch
- ETH Student portal: www.ethz.ch/students/en.html
- Website for students: www.ethz.ch/en/studies.html
- Admissions Office: www.admission.ethz.ch
- Course catalogue: www.vvz.ethz.ch

For detailed information on admission requirements, application and registration procedures and deadlines consult the website of the ETH Admissions Office.

Director of studies

Prof. Dr. Paolo Arosio, HCI F 129
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Consultation upon appointment

Student administration

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Exchange programme

Prof. Dr. Hansjörg Grützmacher, HCI H131
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Consultation upon arrangement with the student administration

Student association

Association of chemistry students at ETH (VCS)
www.vcs.ethz.ch