Appendix

To the Programme Regulations 2018 of the
Master's degree programme in Chemical and Bioengineering

17 October 2017 (Version: 01 August 2020)

Applies to students who commence or re-enter the degree programme in Autumn Semester 2021 or later.
For those entering the programme before Autumn Semester 2021 the stipulation of the previous Appendix apply.

This English translation is for information purposes only. The German version is the legally binding document.

Subject and scope

This appendix sets out the academic, language and performance prerequisites for and further details regarding admission to the Master's degree programme in Chemical and Bio-engineering. It supplements the stipulations of the Admission Regulations of ETH Zurich and the Directive on Admission to Master's degree programmes.

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1 Profile of requirements

Policy
For admission to the Master's degree programme in Chemical and Bioengineering (subsequently 'the degree programme') all of the following prerequisites must be satisfied.

1.1 Degree qualifications

[1] For admission to the degree programme one of the following is required:

a. a university Bachelor's degree in Chemical Engineering comprising at least 180 ECTS[(1] credits (credits) or an equivalent university degree in Chemical Engineering

b. a Bachelor's degree in Chemistry or Chemical Engineering from a Swiss university of applied sciences[(2] comprising 180 credits

c. a university Bachelor's degree comprising at least 180 credits, an equivalent university degree, or a Bachelor's degree from a Swiss university of applied sciences comprising at least 180 credits in a discipline of the Natural Sciences or Engineering (in particular Biochemical or Process Engineering) which – also with regard to any additional academic requirements within the given framework – satisfies the pertaining academic prerequisites listed in Section 1.2.

[2] A Bachelor's degree qualifies its holder for admission to an ETH Master's degree programme only if it also qualifies said holder to enter, without additional requirements, the desired Master's degree programme within the university system where the Bachelor's

[1] ECTS: European Credit Transfer System. Credits describe the average time expended to achieve a learning goal. One credit corresponds to 30 hours of work.

[2] A Diploma from a Swiss university of applied sciences is considered equivalent to a Bachelor's degree in the same discipline. A Bachelor's degree from a German or Austrian university of applied sciences is considered equivalent to a Bachelor's degree from a Swiss university of applied sciences.

degree was acquired. The Rector may also demand proof of this, determining whether such proof must come from the home university or from another university in the country where the Bachelor's degree was acquired.

1.2 Academic prerequisites

[1] Attendance of the Master's degree programme in Chemical and Bioengineering presupposes basic knowledge and skills in the disciplines Natural Sciences, Mathematics, Computer Science and Chemical Engineering which are in content, scope, quality and skill level equivalent to those covered in the ETH Bachelor's degree programme in Chemical Engineering (discipline requirements profile).

[2] The **discipline requirements profile** comprises **123 credits** in total and includes the significant knowledge and skills covered in the ETH Bachelor's degree programme in Chemical Engineering, including the corresponding methodological scientific thinking skills. Details are set out in Para. 5 below.

[3] If an applicant does not completely satisfy the academic prerequisites, admission may be subject to the acquisition of the missing knowledge and skills in the form of additional requirements. Completion of additional requirements is expressed in credits. For further details, see Section 4 below.

[4] Admission to the degree programme is not possible if the academic gaps in the candidate's background are too extensive. For further details, see the Sections below.

[5] The **discipline requirements profile** is structured in two parts set out below. Details regarding the content of the corresponding course units are published in the ETH Course Catalogue (www.courses.ethz.ch).

Part 1: Basic knowledge and skills (113 credits)

Part 1 comprises 113 credits and covers basic knowledge from the disciplines Natural Sciences, Mathematics, Computer Science and Chemical Engineering, and in practical laboratory work.

1A *Natural Sciences, Mathematics and Computer Science (71 credits)*

The substance of the following course units from the ETH Bachelor's degree programme in Chemical Engineering is required:

- Allgemeine Chemie [General Chemistry] I&II: Teil Anorganische Chemie [Inorganic Chemistry section] (7 credits)
- Allgemeine Chemie I&II: Teil Organische Chemie [Organic Chemistry section] (7 credits)
- Allgemeine Chemie I: Teil Physikalische Chemie [Physical Chemistry section] (3 credits)
- Anorganische Chemie I: Komplexe der Übergangsmetalle [Inorganic Chemistry I: Complexes of Transition Metals] (3 credits)
- Anorganische Chemie II: Symmetrieaspekte chemischer Systeme [Inorganic Chemistry II: Symmetrie Aspects of Chemical Bonding] (3 credits)

- Organische Chemie I: Chemische Reaktivität und Stoffklassen [Organic Chemistry I: Chemical Reactivity and Classes of Compounds] (3 credits)
- Organische Chemie II: Umlagerungsreaktionen und Naturstoffchemie [Organic Chemistry II: Organic Transformations and Natural Products Chemistry] (3 credits)
- Physikalische Chemie I: Chemische Thermodynamik [Chemical Thermodynamics] (4 credits)
- Physikalische Chemie II: Chemische Reaktionskinetik [Chemical Reaction Kinetics] (4 credits)
- Analytische Chemie [Analytical Chemistry] I (3 credits)
- Physik [Physics] I: Mechanik, Schwingungen und Wellen [Mechanics, Periodic Motions and Mechanical Waves] (4 credits)
- Physik II: Elektrizität und Magnetismus, Optik und Quantenphysik [Electromagnetism, Optics and Quantum Physics] (4 credits)
- Biochemie und Molekularbiologie [Biochemistry and Molecular Biology] (4 credits)
- GL Mathematik [Mathematics] IA & IB: Ein- und mehrdimensionale Analysis [One- and Multidimensional Calculus] (8 credits)
- GL Mathematik II: Lineare Algebra und Statistik [Linear Algebra and Statistics] (3 credits)
- Mathematik III: Partielle Differentialgleichungen [Partial Differential Equations] (4 credits)
- Informatik [Computer Science] I (4 credits)

1B *Chemical Engineering (24 credits)*

The substance of the following course units from the ETH Bachelor's degree programme in Chemical Engineering is required:

- Stofftransport [Mass Transfer] (4 credits)
- Wärmetransport und Strömungslehre [Heat Transport and Fluid Dynamics] (4 credits)
- Homogene Reaktionstechnik [Homogeneous Reaction Engineering] (4 credits)
- Heterogene Reaktionstechnik [Heterogeneous Reaction Engineering] (4 credits)
- Thermodynamik für Chemieingenieure [Chemical Engineering Thermodynamics] (4 credits)
- Separation Process Technology I (4 credits)

1C *Laboratory work (18 credits)*

Practical laboratory knowledge and competences in synthesis is required.

Part 2: Subject-specific knowledge and competences (10 credits)

Part 2 comprises 10 ECTS credits and covers basic knowledge from the discipline of Chemical Engineering.

The substance of the following course units from the ETH Bachelor's degree programme in Chemical Engineering is required:

- Statistical and Numerical Methods for Chemical Engineers (3 credits)
- Modelling and Mathematical Methods (4 credits)
- Regelungstechnik [Chemical Process Control] (3 credits)

1.3 Language prerequisites

[1] The teaching language of the degree programme is English.

[2] For admission to the degree programme, proof of sufficient knowledge of English (level C1)[3] must be provided.

[3] Applicants to the degree programme who hold a Bachelor's degree from a university of applied sciences must, according to the pertaining additional requirements, also supply proof of sufficient knowledge of German (level C1).

[4] The required language certificates must be submitted by the application deadline. The ETH Zurich publishes a list of the language certificates accepted.

2 Specific stipulations for admission and entering the degree programme

2.1 Specific stipulations for admission to the degree programme

2.1.1 Candidates with a Bachelor's degree in Chemical Engineering from ETH Zurich

Unconditional admission

The following persons are guaranteed unconditional admission to the degree programme:

a. Holders of a Bachelor's degree in Chemical Engineering from ETH Zurich

b. Students enrolled in this ETH Zurich Bachelor's degree programme

[3] The required language level is measured according to the Common European Framework of Reference for Languages (CEFR) scale

2.1.2 Candidates with a Bachelor's degree in chimie et génie chimique from EPF Lausanne

Unconditional admission

Holders of a Bachelor's degree in chimie et génie chimique from EPF Lausanne (EPFL) are unconditionally admitted to the degree programme, provided that

a. the language prerequisites listed in Section 1.3 have been satisfied
b. said Bachelor's degree also guarantees unconditional admission to the Master's degree programme in génie chimique et biotechnologie at EPFL

2.1.3 Candidates with a Bachelor's degree in Chemical Engineering from another university

[1] Holders of a Bachelor's degree or the equivalent in Chemical Engineering from another university than ETH Zurich or EPFL must satisfy all of the academic and language prerequisites listed in Section 1 above for admission to the degree programme.

[2] Admission may be subject to additional requirements.

[3] Admission is not possible if any of the following apply

a. the language prerequisites are not satisfied
b. the content, scope, quality and skills level of the degree are not equivalent to those at ETH Zurich
c. the number of additional credits required to satisfy the academic prerequisites exceeds
    1) 30 credits in total, *or*
    2) 12 credits from Part 1 of the academic prerequisites

2.1.4 Candidates with a Bachelor's degree in Chemistry or Chemical Engineering from a Swiss university of applied sciences

[1] Holders of a Bachelor's degree in Chemistry or Chemical Engineering from a Swiss university of applied sciences may be admitted to the degree programme if they can satisfy all of the following prerequisites

a. the academic requirements are satisfied within the given framework
b. the language prerequisites are satisfied
c. the final Bachelor's degree grade is at least a 5 (according to the Swiss grading system, which involves grades from 1 [lowest] to 6 [highest])[4].

[2] Admission is always subject to the compensation of missing academic and methodological knowledge with additional study achievements comprising at least 40 credits of the third year's course units from the ETH Bachelor's degree programme in Chemical Engineering.

[4] The method of computation of the final grade is stipulated in the Directive on Admission to Master's Degree Programmes (www.directives.ethz.ch).

[3] Admission is not possible if any of the following apply

a. the language or performance prerequisites are not satisfied
b. the number of additional credits required to satisfy the academic prerequisites exceeds 60

2.1.5 Candidates with a university Bachelor's degree in a discipline other than Chemical Engineering

[1] Holders of a university Bachelor's degree or the equivalent in a discipline other than Chemical Engineering may be admitted to the degree programme if they can satisfy all of the following prerequisites

a. the academic requirements set out above are satisfied within the given framework
b. the language prerequisites set out above are satisfied
c. a very good academic performance during the Bachelor's degree studies

[2] Admission may be subject to additional requirements.

[3] Admission is not possible if any of the following apply

a. the language or performance prerequisites are not satisfied
b. the content, scope, quality and skills level of the degree are not equivalent to those at ETH Zurich
c. the number of additional credits required to satisfy the academic prerequisites exceeds
    1) 30 credits in total; or
    2) 12 credits from Part 1 of the academic prerequisites

2.1.6 Candidates with a Bachelor's degree from a Swiss university of applied sciences in a discipline other than Chemistry or Chemical Engineering

[1] Holders of a Bachelor's degree from a Swiss university of applied sciences in a discipline other than Chemistry or Chemical Engineering may be admitted to the degree programme if they can satisfy all of the following prerequisites

a. the academic requirements set out above are satisfied within the given framework
b. the language prerequisites set out above are satisfied
c. a very good academic performance during the Bachelor's degree studies

[2] Admission is always subject to the compensation of missing academic and methodological knowledge with additional study achievements comprising at least 40 credits.

[3] Admission is not possible if any of the following apply

a. the language or performance prerequisites are not satisfied

b. the number of additional credits required to satisfy the academic prerequisites exeeds 60

2.2 Specific stipulations for entering the degree programme

2.2.1 Candidates with an ETH Bachelor's degree in Chemical Engineering

[1] Students of the ETH Zurich Bachelor's degree programme in Chemical Engineering may enrol in the degree programme directly via *www.mystudies.ethz.ch*. The admission procedure outlined in Section 3 is waived. Further details:

a. The normal ETH enrolment dates and deadlines apply.

b. Enrolment is possible as soon as only a maximum of 60 credits towards the Bachelor's degree are pending.

c. Admission is provisional until the Bachelor's degree is issued. Admission will be revoked if the Bachelor's degree is not or cannot be issued.

2.2.2 Candidates with an ETH Bachelor's degree in a discipline other than Chemical Engineering

The following stipulations regarding entry to the Master's degree programme apply to students from an ETH Zurich Bachelor's degree programme (other than Chemical Engineering) who have been granted admission:

a. The normal ETH enrolment dates and deadlines apply.

b. They can enrol in the programme once they have acquired that number of credits which would qualify them to enrol in the Master's degree programme consecutive to their original subject.[5]

c. Admission is provisional until the Bachelor's degree is issued. Admission will be revoked if the Bachelor's degree is not or cannot be issued.

2.2.3 Candidates with a Bachelor's degree from another university

Non-ETH graduates who have been granted admission may only begin the degree programme when they have completed the previous (Bachelor's) degree programme.

[5] The permitted number of missing credits is set out in the Programme Regulations of the respective consecutive Master's degree programme (e.g., BSc Physics → MSc Physics).

3 Application and admission procedure

[1] All candidates – with the exception of matriculated ETH Zurich students from the Bachelor's degree programme in Chemical Engineering – must submit an application for admission to the degree programme. The binding specifications for application, in particular the documents required and the submission dates/deadlines, are published on the website of the ETH Zurich Admissions Office (www.admission.ethz.ch).

[2] Application may be made even if the required preceding degree has not yet been issued.

[3] Applications will not be considered if

a. they are submitted late or not in the correct form, or
b. the relevant fees have not been paid.

[4] The admissions committee of the degree programme determines how far the background of the candidate corresponds to the profile of requirements and submits an application for admission/rejection to the Director of Studies.

[5] On the request of the Director of Studies the Rector makes the final decision regarding admission or rejection.

[6] The candidate receives a written admissions decision which includes relevant information concerning any additional admission requirements.

4 Fulfilling additional admission requirements

4.1 General regulations

[1] Candidates who are admitted subject to the fulfilment of additional requirements must acquire the required additional knowledge and skills before or during the Master's degree programme via self-study or by attending classes. The corresponding individual performance assessments must take place by set deadlines.

[2] If the candidate fails said performance assessments or does not respect the set deadlines she/he will be regarded as having failed the programme and will be excluded from it.

[3] The deadlines and conditions for undergoing said performance assessments depend upon the background of the candidate (see Sections below).

4.2 Candidates with a university Bachelor's degree

[1] Candidates holding a university Bachelor's degree must undertake all of the performance assessments pertaining to the additional admission requirements by the end of the first year of the Master's degree programme at the latest. All additional requirements, including any assessment repetitions, must be fulfilled within 18 months of the start of the Master's degree programme at the latest.

[2] A pass grade in each individual performance assessment is required.

[3] A failed performance assessment may only be repeated once.

4.3 Candidates with a Bachelor's degree from a Swiss university of applied sciences

[1] Candidates holding a Bachelor's degree from a Swiss university of applied sciences must undertake all of the performance assessments pertaining to the additional admission requirements by the end of the first year of the Master's degree programme at the latest. All additional requirements, including any assessment repetitions, must be fulfilled within two years of the start of the Master's degree programme at the latest.

[2] Session examinations may be combined in examination blocks. The examinations belonging to one examination block must always be undertaken during the same examination session.

[3] A pass grade in the examination block is achieved if the average of the individual grades is at least a 4.

[4] A failed performance assessment or a failed examination block may be repeated once. Repeating an examination block entails repeating all of the examinations belonging to it.