Programme specifics
MASTER OF SCIENCE
CHEMICAL ENGINEERING

2019-2020

DELFT UNIVERSITY OF TECHNOLOGY

Administrative data

Nomenclature in CROHO	**MSc Chemical Engineering**
CROHO registration number	**60437**
Orientation and level of the programme:	**Higher education, Academic Master level**
Number of credits	**120 ec, 2 years**
Mode(s) of study	**Fulltime**
Period of NVAO accreditation	**1 January 2019 till 31 December 2024**
Period of IChemE accreditation	**Intake years 2018 and 2019**

THIS DOCUMENT

This document is part of the Teaching and Examination Regulations and applies for the Master's degree programme in Chemical Engineering.

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Article 1 – The programme's final attainment levels

The Chemical Engineering Master's programme at Delft University of Technology is intended to educate students with knowledge, insights and skills to become independent and responsible researchers or engineers in the field of Chemical Engineering.

In addition to the general attainment levels described in article 4 of the teaching and examination regulations, and in line with the EFCE Bologna recommendations of the European Federation of Chemical Engineering (http://efce.info/Bologna_Recommendation.html), MSc Chemical Engineering graduates should fulfil the following qualifications:

1. Knowledge and Understanding
   The graduates have acquired the fundamental principles of chemical engineering for the modelling and simulation of chemical reactions and molecular processes, of energy, mass and momentum transport processes, and of separation processes. They are familiar with the principles of experimental measurement techniques and control thereof.
   The graduates have acquired extensive and profound knowledge of a selected area of chemical engineering (Process Engineering or Chemical Product Engineering) and related sciences, which enable them to carry out scientific work and to act responsibly in their professions and in society. They are aware of new developments in their field.

2. Engineering Analysis
   The graduates are able to:
   - identify and analyse chemical engineering problems scientifically, even if the definitions are incomplete or are formulated in an unusual way and show competing specifications;
   - abstract and formulate complex problems from a new or a developing field;
   - select and apply suitable, innovative, methods of analysis, modelling, simulation and optimisation, based on fundamental principles and taking into account economic and environmental aspects.

3. Engineering Design
   The graduates are able to:
   - develop concepts and solutions to chemical engineering problems based on fundamental principles but also to problems which are posed in an unusual way, if necessary involving other fields;
   - understanding of design methods and the ability to apply them;
   - develop new products, equipment, processes or methods;
   - use library and web resources for the acquisition of information regarding equipment characteristics and design methods, chemical and physical properties and data;
   - use their powers of judgment as engineers in order to work with complex and possibly incomplete information, to recognise discrepancies or feasibility concerns and to deal with them.

4. Investigations/Research
   The graduates are able to:
   - tackle a real chemical engineering problem by a scientific approach;
   - recognise the need for information, to find and critically assess information;
   - make an appropriate safety assessment before starting experimental work;
   - formulate, plan and carry out theoretical or experimental research at the forefront of a specific chemical engineering area;
   - evaluate data critically and to draw conclusions from it;
   - examine and evaluate the application of new and emerging technologies.

5. Engineering Practice
   The graduates are able to:
   - combine theory and practice in order to analyse and solve problems of engineering science using methods based on fundamental principles;
   - apply their knowledge in different areas, taking safety measures and ecological and economic demands into account;
   - classify knowledge from various fields methodically and draw systematic conclusions from it and also to deal with the complexity of different demands and boundary conditions;
   - think systematically about the non-technical effects of an engineer's job and to include these aspects responsibly in what they do.

6. Transferable Skills
   The graduates are able to:
   - present the results of their work in written and oral form in a scientifically sound and effective manner;
   - organise and carry out projects;
   - function effectively as a member of a multicultural team composed of different disciplines and/or levels;
   - work and communicate effectively in national and international contexts, with specialists and non-specialists;
   - understand professional and ethical responsibility, and act accordingly;
   - learn on their own, and recognise the need for life-long learning.

Article 2 – Admission to the programme

2.1 All students possessing a certificate proving that they have successfully completed their Bachelor of Science studies in Molecular Science & Technology with major technology, Chemical Engineering in 4TU or at the Rijksuniversiteit Groningen will be admitted to the programme. Molecular Science & Technology students with a non-technology major are eligible for direct admission if they have completed the following technology courses:

Code	Course Module	Credits
4052LADIFY	Linear Algebra and Differential Equations	6
4052FYSTRY	Fysische Transportverschijnselen	6
4052CHREKY	Chemische Reactorkunde	6
4052SCHTEY	Scheidingstechnologie	6
4052NUMTEY	Numerieke Technieken	3

2.2 Students who do not possess the degree mentioned in paragraph 1 are required to obtain proof of admission to the programme from the dean, who will seek the advice of the admissions officer on this matter.

2.3 In order to obtain proof of admission, the student must meet or, as the case may be, possess:

a. The general relevant criteria set by the executive board in the "Policy on fees and enrolment", laid down in Appendix 1 of the Student Charter (central part), and clarified in Part 1.2 " Entrance and admission" of the mentioned Student Charter.
b. A certificate, together with the accompanying list of marks, proving that he/she possesses knowledge of a sufficiently high level and broad scope to successfully complete the Master's programme within the allocated period.

2.4 Students in possession of

a. a Bachelor of Science degree in Chemical Engineering or equivalent from a foreign university can be admitted to the programme provided he/she has a minimum Grade Point Average of 75%.
b. a Bachelor of Science degree in Chemistry from a Dutch or foreign university can be admitted to the Chemical Product Engineering track of the programme including homologation courses, provided he/she has a minimum Grade Point Average of 75% and no delay of study. This holds as well for Molecular Science & Technology students with a non-technology major. Official admission by the programme management is required.
c. a Bachelor of Science degree in Chemistry or equivalent from a Dutch university, or a Bachelor of Science degree in Aerospace Engineering, Applied Earth Sciences, Applied Physics, Life Science and Technology, Mechanical Engineering, or Nanobiology from Delft University of Technology having passed the TU Delft Chemical Engineering bridging programme as part of their degree will be admitted to the programme. Official admission by the programme management to the Bridging programme is required.
d. a Bachelor of Engineering degree in Chemical Technology or equivalent from a Dutch university of Applied Sciences (HBO), admitted to and having passed the TU Delft Chemical Engineering bridging programme as part of their degree, will be admitted to the programme.
e. a Bachelor of Engineering degree in Chemical Technology or equivalent from a Dutch university of Applied Sciences (HBO), not having passed the TU Delft Chemical Engineering bridging minor programme as part of their degree, can be admitted to the bridging programme provided he/she has a minimum Grade Point Average of 75% and no delay of study. Admission to and completion of the bridging programme within the designated time (in accordance with TU regulations), guarantees admission to the programme.

2.5 Because of the very large number of applications from India, MSc Chemical Engineering has a more stringent requirement for applicants in possession of a Bachelor degree obtained in India, compared to other MSc programmes at the university. To be considered for admission, they should have a (minimum) four year Bachelor's degree in Chemical Engineering or equivalent from a mainstream university (state / federal or 'deemed' institution) passed with First Class *Distinction* - or First Class from one of the Indian Institutes of Technology, Birla Institute of Technology & Science (Pilani), or Institute of Chemical Technology (Mumbai).

Article 3 – Structure of the programme.

3.1.a The Master Chemical Engineering is a two-year programme comprising 120 EC. The programme has a core-orientation structure. Within this structure, there is a choice of tracks. The core programme comprises 90 EC and has the same structure for all students. Combining the core programme with a 30 EC orientation completes the programme.

3.2 **Tracks**

The tracks within the Chemical Engineering programme are:

- Chemical Product Engineering (CPE),
- Process Engineering (PE).

3.3 **Orientations**

Four orientations of 30 EC each can be chosen:

- Research and Development (R&D),
- Education (Ed1/Ed2),
- Management of Technology (MoT),
- Study Abroad (SA).

3.4 **Programme additions**

- Honours programme. This is an additional challenging individual programme for students with higher than average performance (>7.5 weighted average and no study delay).
- Double degree programme Chemical Engineering – Management of Technology.
- Nuclear Science Engineering Annotation
- Other additions must be approved by the board of examiners.

Article 4 – Composition of the programme

4.1.1 The core programme of each track comprises 90 credits and is the same for each student:
- Obligatory core modules (15 credits)
- Obligatory track modules (15 credits)
- Obligatory design modules (20 credits)
- MSc thesis project (40 credits)

4.1.2 Combining the core programme with a 30 credits Scientific and Social Orientation (elective part) completes the programme.

4.1.3 The first year consists of core modules, track modules, modules belonging to the orientation part of the programme and/or a design project.
The second year consists of the Master's thesis project, and modules belonging to the orientation part of the programme and/or a design project.

4.1.4 Only one track is mentioned on the degree certificate. Courses of a second track can be done as electives, or within the honours programme. Students are responsible for registering the track of their choice. The final choice must be made before handing in the diploma application form.

4.2 – The Chemical Product Engineering track

4.2.1 The core programme consists of the following course modules:

Code	Course Module	Credits
	Obligatory Core Modules	**15**
CH3132a	Applied Numerical Mathematics	5
CH3142	Molecular Thermodynamics	5
CH3152	Molecular Transport Phenomena	5
	Obligatory Track Modules	**15**
CH3162a	Design and Synthesis of Advanced Chemical Products	6
CH3173a	Structure/Property Relationships of Advanced Chemical Products	6
CH3372a	Soft Matter for Chemical Products	3
	Obligatory Design Modules	**20**
CH3804	Product & Process Design	5
WM0320TU	Ethics and Engineering	3
CH3843	Design project	12
CH3901	**MSc Thesis work**	**40**

4.2.2 The Chemical Product Engineering track has the following specialisations (ChemE):
- Advanced Soft Matter,
- Catalysis Engineering,
- Materials for Energy Conversion and Storage,
- Optoelectronic Materials,
- Organic Materials and Interfaces,
- Product and Process Engineering
- and Inorganic Systems Engineering.

4.2.3 In addition to the list mentioned under 4.2.2, the student may choose another option for his/her thesis work. However, this choice has to be approved by the board of examiners before the start of the project.

4.3 – The Process Engineering track

4.3.1 The core programme consists of the following course modules:

Code	Course Module	Credits
	Obligatory Core Modules	**15**
CH3132a	Applied Numerical Mathematics	5
CH3142	Molecular Thermodynamics	5
CH3152	Molecular Transport Phenomena	5
	Obligatory Track Modules	**15**
CH3043a	Process Dynamics & Control	3
CH3053	Applied Transport Phenomena	6
CH3681a	Reactors & Kinetics	6
	Obligatory Design Modules	**20**
CH3804	Product & Process Design	5
WM0320TU	Ethics and Engineering	3
CH3843	Design project	12
CH3901	**MSc Thesis work**	**40**

4.3.2 The Process Engineering track has the following specialisations (ChemE):
- Advanced Soft Matter,
- Catalysis Engineering,
- Materials for Energy Conversion and Storage,
- Optoelectronic Materials,
- Organic Materials and Interfaces,
- Product and Process Engineering,
- Transport Phenomena,
- Inorganic Systems Engineering,
- and Intensified Reaction & Separation Systems (P&E, 3mE).

4.3.3 In addition to the list mentioned under 4.3.2, the student may choose another option for his/her thesis work. However, this choice has to be approved by the board of examiners before the start of the project.

4.4 – Scientific and Social Orientation

The programme includes a 30 EC of 'Orientation'. The student may opt for:

4.4.1 **Research and Development**

This programme is especially tailored for students who will work in industry after completing their Master's education. It consists of:
- Industrial Internship (CH3702, 18 credits), and
- Electives (12 credits):
  - Suggested Chemical Engineering electives: 6-12 credits
  - Free electives (MSc level modules offered by other TU Delft programmes, and modules that focus on transferable skills): 0-6 credits

Suggested Chemical Engineering electives are obligatory track modules from a second track and modules from the list below. The choice of electives has to be approved by the board of examiners if less than 6 credits are mentioned on the list of suggested electives or homologation modules.

Code	Course Module	Credits
CH3012	Advanced Interfacial Engineering	3
CH3061	Multiphase Reactor Engineering	4
CH3073	Separation Processes, Design and Operation	3
CH3101	Heterogeneous Catalysis	3
CH3181	Scale Up / Scale Down	3
CH3222	Energy Storage in Batteries	4
CH3291	International Design Contest	3
CH3421	Computational Transport Phenomena	6
CH3512	Electrochemistry for Renewable Energy 1: Fundamentals (ERE1)	3
CH3531	Functional Ceramics	3
CH3542	Inorganic Materials	3
CH3562	Nanoparticle Technology	3
CH3622	Process Intensification	3
CH3622-PR	Process Intensification – Project	2

CH3632	Chemistry and Physics of Solar Cells	6
CH3672	Computational Materials Science	3
CH3763	Nuclear Medicine	3
CH3783	Materials Chemistry for the Nuclear Fuel Cycle	3
CH3771	Nuclear Chemistry	6
CH3982	Literature Study	3
AP3171	Advanced Physical Transport Phenomena	6
AP3252	Electron Microscopy Characterization of the Nanoscale	3
AP3371	Radiological Health Physics	6
LM3731	Biocatalysis	6
LM3311	Green Chemistry and Sustainable Technology	3
SET3070	Thermochemistry of Biomass Conversion	4
SET3075	Biochemistry of Biomass Conversion	4
SET3085	Hydrogen Technology	4

Courses not given this year:
CH3522 Electrochemistry for Renewable Energy 2: Applications (ERE2)
WI4510TU Statistical Learning for Engineers [cursus opgeheven]

Example free elective modules are:

Code	Course Module	Credits
AS3111	ATHENS	2
AS3121	Scientific Writing and Argumentation	3
AS3131	Art, Empathy & Ethics	4
CH3301	Foreign Excursion Tour TG	3
WM0203TU-Eng	Oral Presentations	2
WM1101TU	English for Academic Purposes-3	3
WM1102TU	Written English for Technologists-2	3
WM1112TU	Spoken English for Technologists-2	3
WM1115TU	Dutch Elementary 1	3
WM1116TU	Dutch Elementary 2	3
WM1117TU	Dutch Intermediate 1	3
WM1135TU	English for Academic Purposes-4	3
WM1136TU	Written English for Technologists-1	3
WM1137TU	Spoken English for Technologists-1	3

Within the R&D orientation, students can fulfil the requirements for the Technology in Sustainable Development (TiSD) and Entrepreneurship annotations. Certificates will be granted during the graduation ceremony upon request of the student.

Technology in Sustainable Development (TiSD) is a university-wide initiative. Approval of the Master's thesis work and the internship by the coordinator (W.G. Bouwman) is required. The thesis project must be focussed on sustainable development or the development of knowledge and technology aimed at a more sustainable future, and also the industrial internship should have a clear relation to sustainability. The requirements for the TiSD annotation also include the 'Technology in Sustainable Development' (WM0939TU, 5ec) course and 10 credits of elective modules from the TiSD cluster-A and cluster-B lists. The lists can be found at www.tudelft.nl/tisd.

For the Annotation Entrepreneurship (AE) at least 20 credits of modules on Entrepreneurship are required; 15 credits are compulsory:

Code	Course Module	Credits
MOT9610	Entrepreneurship basic course	5
MOT9611	Project entrepreneurship thesis related	5
MOT9612	Business development lab (short)	5
	Elective(s) on entrepreneurship	5

4.4.2 **Education** (taught in Dutch)
The educational programme is aimed at Dutch-speaking students only, because they are oriented towards the Dutch school system and because it includes internship at Dutch secondary schools.

Consequently the modules are taught in Dutch. The programme consists of Basisdeel/Ed1 (30 EC) and Verdiepingsdeel/Ed2 (30 EC).
The minor Education (Basisdeel/Ed1) can be done during the bachelor programme and leads to qualification as a tweedegraads secondary school teacher with limited qualification (beperkte bevoegdheid). If a student has done the minor Education, only the Verdiepingsdeel/Ed2 of 30 EC remains for the Master's programme orientation. The combination of the minor Education and Ed2 orientation leads to qualification as a fully-qualified eerstegraads (grade-one) secondary school teacher.

Students that didn't take the minor Education can follow the Basisdeel/Ed1 orientation as part of their Master's programme and then do the Verdiepingsdeel/Ed2 as a post-master course in order to become fully qualified. The programme has to be approved by coordinator, M.A.F.M. Jacobs.

Code	Course Module	Credits
	Education Basis	
SL3031	Didactical Skills	3
SL3041	Orienterende Stage	3
SL3116	Research Methodology in the Social Sciences for Education	3
SL3132	Didactics Chemistry 1	2
SL3174	Field Orientation Chemistry A	9
SL3342	Didactics Chemistry 2	4
SL3462	Educational Science	6
	Education Verdieping	
SL3012	Integration SC/SE	3
SL3021	The Designing of Communication and Education Products	6
SL3311	Research of Education	6
SL3381	Didactics Chemistry 3	3
SL3424	Field Orientation Chemistry B	12

4.4.3 **Management of Technology**
This orientation is offered by the faculty of Technology, Policy and Management. The programme consists of either the first semester or the second semester of the MSc Management of Technology. A mixture of courses from both semesters is only permitted if it is a coherent set of modules that is approved by the MoT programme coordinator, dr. R.M. Verburg, in advance.

Code	Course Module	Credits
	1st SEMESTER MoT Modules (30 EC)	
MOT1412	Technology Dynamics	5
MOT1421	Economic Foundations	5
MOT1442	Social and Scientific Values	5
MOT1461	Corporate Finance	5
MOT1524	Leading and Managing People	5
MOT1532	High-tech Marketing	5
	2nd SEMESTER MoT Modules (30 EC)	
MOT1003	Integration Moment	5
MOT1435	Technology Strategy and Entrepreneurship	5
MOT1451	Inter- and Intra-organisational Decision Making	5
MOT1531	Business Process Management & Technology	5
MOT2312	Research Methods	5
MOT2421	Emerging and Breakthrough Technologies	5

4.4.4 Study Abroad
This programme consists of a semester at a foreign university. A package of 30 EC of courses (optionally including a research project of a maximum of 20 EC) must be done. This programme is especially recommended for students who will do a PhD after completing their Master's education.
A Study Abroad programme must always be approved by the board of examiners in advance.

4.4.5 Double Degree
Students opting for a double degree (second master) after having obtained permission from the programme directors of both Master's programmes are allowed to dedicate the Scientific and Social

Orientation (30 EC) of Chemical Engineering on modules from the second Master's programme. Double degree programmes are always subject to the restrictions imposed by the university and have to be approved by the board of examiners (in case it deviates from the standard programmes e.g. double degree with MoT). In line with the university's restrictions, the double degree programme has to comprises at least 180 EC of which at least 60 EC must be unique for each programme. The student should produce two thesis projects with two distinct thesis reports for each programme (thesis requirements apply). In case of a joint thesis project(combined thesis project for both programmes), the student hands in two separate reports, one per programme, or one final report where the (non)overlapping parts per programme are clearly indicated. Joint projects need to be approved by the board of examiners based on the content and scope of the project.

4.5 – Honours Programme

The Honours Programme consists of at least 20 EC in addition to the regular Master's programme of 120 EC. The individual programme contains a 5-EC course for all TU Delft honours track students plus a coherent package of at least 15 EC of challenging courses or projects composed by the student.

Programme			**Credits**
Collective Part – obligatory UD2010, Critical Reflection on Technology			5
Individual Part **Examples:** Company Oriented HPM AS1011HPM AS1021HPM Research Oriented HPM AS1031HPM x Design Oriented HPM x Courses	 Applied Sciences Company Project Applied Sciences Honours Classes Applied Sciences Research Project Project related course PDEng courses (ST6xxx) coherent package of courses	 12 3 9-15 0-6 15 15	15

4.6 – Nuclear Science Engineering (NSE) Annotation

Chemical Engineering students are given the opportunity to acquire the annotation in the field of Nuclear Science & Engineering (together with their diploma) if they meet the following requirements:
(1) Electives, design project, internship: *at least* 15 ECTS points which are NSE related, including *at least* 9 ECTS from the NSE electives list. (2) MSc thesis project: covers an NSE-related subject.
Some examples are:
Example 1: 9 EC for NSE Electives, 12 EC for Design Project (NSE), 40 EC for MSc thesis Project (NSE)
Example 2: 15 EC for NSE Electives, 40 EC for MSc thesis Project (NSE)
Example 3: 9 EC for NSE Electives, 18 EC for Internship (NSE), 40 EC for MSc thesis Project (NSE)

The NSE-electives are:

Code	Course Module	Credits
CH3771	Nuclear Chemistry	6
CH3763	Nuclear Medicine	3
CH3783	Materials Chemistry for The Nuclear Fuel Cycle	3
AP3091	Elementary Particles	6
AP3232	Medical Imaging Signals and Systems	6
AP3311	NXP for studying microscopic structures and dynamics	6
AP3341	Nuclear Reactor Physics	6
AP3352	Introduction to Nuclear Science Engineering	6
AP3371	Radiological Health Physics	6
AP3582	Medical Physics of Photon and Proton Therapy	6

Whether the MSc thesis, design project, or internship are NSE-related has to be decided upon by the NSE coordinator, Dr. Martin Rohde (m.rohde@tudelft.nl). Students who opt for the NSE annotation need to take the MSc programme requirements into account as well.

4.7 – Double degree programme Chemical Engineering– Management of Technology

This is a three year programme Chemical Engineering – Management of Technology of the Faculties of Applied Sciences (AS) and Technology, Policy and Management (TPM).
Students finishing a Master Chemical Engineering degree with orientation MoT may decide to do an additional year of Master MoT courses and thesis in order to obtain a double degree in both ChE and MoT. Access to this double degree programme is decided upon by the programme directors of the MSc Chemical Engineering and the MSc Management of Technology. The programme consists of:

Programme	**Credits**
The Chemical Engineering Core Programme	90
1st semester MoT modules (list of modules in art. 4.4.3)	30
The ChE orientation MoT / 2nd semester MoT modules (list of modules in art. 4.4.3)	30
MOT2004, Preparation for the Master's Thesis	5
MoT MSc Thesis Project (MOT2910)	30

The 120EC Chemical engineering part of the programme consists of the 90EC ChE Core Programme and the 30EC second semester MoT modules.

More generally, double degree programmes combining Chemical Engineering with other Master's courses taught at Delft are possible, but always subject to the restrictions imposed by the university. The main restrictions are that the double degree programme comprises at least 180 EC and that there are two identifiable final project reports for both degrees. Formal admission to the double degree programme by the programme directors is required in advance.

4.8 – The free study programme

Students may compile a free curriculum concluded by a final exam. Such a curriculum must consist entirely or mainly of modules given in conjunction with the programme. It has to comply with the final attainment levels of the programme. The curriculum must be accompanied by a justified request and submitted to the Board of Examiners for approval.

Article 5 – Bridging and homologation programmes

5.1 Students who have been admitted to the Chemical Product Engineering track on the basis of a Bachelor of Science university degree in Chemistry or Molecular Science & Technology with a non-techology major must complete a homologation programme consisting of the following engineering modules:

Code	Course Module	Credits
CH3073	Separation Processes, Design and Operation	3
4052CHREKY	Chemical Reactor Engineering	6
4052FYSTRY or AESB2320	Fysische Transportverschijnselen / Physical Transport Phenomena	6/5

It is strongly recommended to follow extra mathematics courses in linear algebra and differential equations, a course in physical transport phenomena, thermodynamics of phase equilibria, and Matlab, Python or a programming language before the Master's programme is started.
Homologation modules are not required if a student eliminates deficiencies before enrolling in the Master's programme, by completing the following bachelor courses:

Code	Course Module	Credits
4052FYSTRY	Fysische Transportverschijnselen	6
4052CHREKY	Chemische Reactorkunde	6
4052NUMTEY	Numerieke Technieken	3
4052SCHTEY	Scheidingstechnologie	6

These deficiencies must be eliminated for admission to the Process Engineering track on the basis of a Bachelor of Science university degree in Chemistry.

5.2 Students who have been admitted on the basis of a Dutch institute of Higher Education (HBO) Bachelor of Engineering degree Chemical Technology (or equivalent) have to complete a bridging programme consisting of the following Dutch or English modules before they can enrol in the Master's programme:

Code	Course Module	Credits
	Dutch	**33**
WI1708TH1	Analyse 1	3
WI1708TH2	Analyse 2	3
WI1807TH1	Lineaire Algebra 1	3
WI1909TH	Diffrentiaal vergelijkingen	3
4052FYSTRY	Fysische Transportverschijnselen	6
4052CHREKY	Chemische Reactorkunde	6
4052SCHTEY	Scheidingstechnologie	6
4052NUMTEY	Numerieke Technieken	3
	English	**39**
AESB1110-15	Mathematics 1	5
AESB1210-15	Mathematics 2	5
AESB2110	Mathematics 4	5
AESB2210	Mathematics 5	5
AESB2220	Chemical Thermodynamics	5
AESB2320	Physical Transport Phenomena	5
4052CHREKY	Chemical Reactor Engineering	6
CH3073	Separation Processes, Design and Operation	3

5.3 Students holding a Bachelor of Science degree in Aerospace Engineering, Applied Earth Sciences, Applied Physics, Life Science and Technology, Nanobiology, or Mechanical Engineering from Delft University of Technology are not always qualified for direct admission. In general a Chemical Engineering bridging programme must be done before they can enroll in the Master's programme.
With special permission, as part of the admission, a maximum of 12 credits of homologation courses can be done as part of the Master's programme.

a) Bridging programme for BSc Aerospace Engineering contains at least:

Code	Course Module	Credits
4051ALACHY	Algemene en Anorganische Chemie	6
4051OCSTRY	Organische Chemie en Structuuranalyse	9
4051CHAN3Y	Chemische analysemethoden	3
4052CHREKY	Chemical Reactor Engineering	6
4052SCHTEY	Scheidingstechnologie	6
		30

b) Bridging programme for BSc Applied Earth Sciences contains at least:

Code	Course Module	Credits
4051OCSTRY	Organische Chemie en Structuuranalyse	9
4051CHAN3Y	Chemische Analysemethoden	3
4052CHREKY	Chemical Reactor Engineering	6
4052SCHTEY	Scheidingstechnologie	6
4052STEVMY	Structuur en Eigenschappen van Materialen	6
		30

c) Bridging programme for BSc Applied Physics contains at least:

Code	Course Module	Credits
4051ALACHY	Algemene en Anorganische Chemie	6
4051OCSTRY	Organische Chemie en Structuuranalyse	9
4051CHAN3Y	Chemische Analysemethoden	3
4052CHREKY	Chemical Reactor Engineering	6
4052SCHTEY	Scheidingstechnologie	6
		30

d) Bridging programme for BSc Life Science and Technology contains at least:

Code	Course Module	Credits
WI1807TH1	Lineaire Algebra 1	3
WI1909TH	Diffrentiaal vergelijkingen	3
4052CHREKY	Chemische Reactorkunde	6
4052SCHTEY	Scheidingstechnologie	6
4052NUMTEY	Numerieke Technieken	3
		21
	For a 30ec bridging minor courses from the minor Advanced LST can be added; e.g. LB2801, LB2961, LB2971, LB2981	

It is recommended to replace LB2532 (Transport Phenomena in the Life Sciences) by 4052FYSTRY.

e) Bridging programme for BSc Mechanical Engineering contains at least:

Code	Course Module	Credits
4051ALACHY	Algemene en Anorganische Chemie	6
4051OCSTRY	Organische Chemie en Structuuranalyse	9
4051CHAN3Y	Chemische Analysemethoden	3
4052STEVMY	Structuur en Eigenschappen van Materialen	6
4052CHREKY	Chemical Reactor Engineering	6
		30

f) Bridging programme for BSc Nanobiology contains at least:

Code	Course Module	Credits
4051OCSTRY	Organische Chemie en Structuuranalyse	9
4052STEVMY	Structuur en Eigenschappen van Materialen	6
4052FYSTRY	Fysische Transportverschijnselen	6
4052CHREKY	Chemical Reactor Engineering	6
4052SCHTEY	Scheidingstechnologie	6
		33

Article 6 – Examinations

6.1 The form of the examinations and the methods of assessment

The form of the examinations and the methods of assessment are described in the (digital) study guide, http://chem.msc.studyguide.tudelft.nl.

6.2 The order of exams

6.2.1 Design project (CH3843)

A proof of full participation in the preparatory PPD course (CH3804) is required and at least 12 ec of other Chemical Engineering Master's courses/electives must have been completed to be admitted to the Design Project. Presence, making assignments and sitting for the exam is considered as proof for full participation in the PPD course.
Students doing homologation (bridging) courses as part of their Master's programme must have completed all (except at most one) of these courses.

6.2.2 Graduation Project, Master's thesis (CH3901)

The student should at least have completed the following modules before starting the Thesis Project:

1. all bridging/homologation modules,
2. the obligatory core and track modules,
3. the design project or the orientation part of the programme.

The student should make a project plan with the responsible thesis supervisor and hand in the completed registration form (MEP-form) before the start of the project.

The date and time of the Master's thesis defense is determined by the thesis supervisor in consultation with the student. In exceptional cases, the board of examiners may be involved in setting this date and time. The form has to be signed by the coordinator before it can be processed by the Thesis Office of Applied Sciences. Students are not allowed to start a thesis project without having received the approval from the coordinator or thesis office. Further rules governing the MSc graduation projects can be found in article 26 to 29 of the Rules and Guidelines of the Board of Examiners

Article 7 – Transition ruling Chemical Engineering

7.1 Equivalences:
CH3122 = AS3131 (code changed)
CH3622-P = CH3622-PR (total number of credits changed)
CH3222SET = CH3222 (code changed)
CH3253SET = SET3070 (code changed)
LM3261SET = SET3075 (code changed)
CH3232SET = SET3085 (code changed)
CH3131A = CH3132A (total number of credits changed)
CH3151 = CH3152 (total number of credits changed)
CH3141 = CH3142 (total number of credits changed)
CH3011 = CH3012 (course name changed)
CH3792 = AP3352 (code changed)
CH3782 + CH3582 = CH3783 (two courses merged)
CH3041 = SC4190CH = CH3042 = CH3043
CH3051TU = CH3052 = CH3053
CH3061 = CH3062
CH3071 = ME1590CH = CH3072 = CH3073 + WB4429
CH3161 = CH3162
CH3621 = ME1592CH = CH3622 + CH3622-P
CH3803 = CH3804
CH3842 = CH3843
WM0320TU = WM0329TU
Differences in credits may be compensated in the electives. Exception to this rule: CH3042+CH3053 and CH3052+CH3043 always count as 9 credits (and not 6 or 12).
The total number of credits obtained by passing the three different obligatory first-quarter courses (CH3132A or CH3131A, CH3152 or CH3151 and CH3142 or CH3141) are always equal to 15 EC.

7.2 Equivalences and alternatives for Bridging/Homologation modules:
4051CALC1Y = WI1708TH1 + WI1708TH2
4052DIFFVY = MSTTDIF = WI2149ST
4052LINEAY = MSTTLIN = WI2148ST
4052LADIFY = 4052LINEAY + 4052DIFFVY
4052LADIFY = WI1807TH1 + WI1909TH
4052FYSTRY = MSTTFTV = ST2122 = TN2785