Curriculum for the Master's Degree Programme

Chemical and Process Engineering

Curriculum 2025

This curriculum was approved by the Senate of Graz University of Technology during its meeting on 23 June 2025. The legal bases of this degree programme are the Universities Act 2002 (UG) and the Excerpt of Statutes: Legal Regulations for Academic Affairs of TU Graz, as amended.

(Please note: The English version of this document is a courtesy translation. Only the German version is legally binding.)

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I. General

§ 1 Subject matter of the degree programme and qualification profile

The Master's Degree Programme Chemical and Process Engineering (abbrev. CE) is an engineering degree. Graduates of this degree programme are awarded the academic degree "Diplom-Ingenieurin" or "Diplom-Ingenieur," abbreviated as "Dipl.-Ing." or "DI". The international equivalent of this university degree is "Master of Science", abbreviated as "MSc."

The Master's Degree Programme Chemical and Process Engineering is provided as a foreign-language degree programme in English.

(1) Subject matter of the degree programme

Chemical and process engineering is a branch of the engineering sciences that deals with the development and optimisation of substance transformation processes. These processes utilise chemical reactions, mechanical processing, or thermal reactions, and need to be as efficient, safe, and environmentally friendly as possible in order to sustainably produce products in large quantities for industrial sectors such as chemicals, food, energy, or pharmaceuticals.

The Master's Degree Programme Chemical and Process Engineering teaches students the knowledge and skills needed for the planning and operation of industrial material transformation processes.

Graduates of this master's degree programme are able to categorise material transformation processes, design them according to engineering principles, and evaluate them in terms of their economic viability. Furthermore, graduates are qualified to assume leadership positions in international and interdisciplinary work environments. Through research-led teaching, the design exercise and the master's thesis at TU Graz or with business partners, students become familiar with the state of the art and the latest scientific findings.

The master's degree programme addresses the interdisciplinary challenges involved in the planning and operation of material conversion processes. Students can choose two specialisation within the field according to their interests and intended career path, as well as courses from two elective modules, and free-choice subjects. The close connection to practice and a focus on innovation within the specialisation and elective courses allow students to conduct high-quality and structured research.

Graduates are optimally prepared for careers in an international working environment as the courses in the degree programme are held primarily in English. Furthermore, students are expressly recommended to participate in international conferences, seminars, and summer schools.

Following the principles of a university education, graduates are able to work with a high degree of independence and self-responsibility.

(2) Qualification profile and competences

Graduates of the Master's Degree Programme Chemical and Process Engineering have the following knowledge, skills and competencies:

Knowledge and understanding

Graduates have specialist knowledge in the following areas:

- Chemical and Process Engineering Advanced Fundamentals: technical separation processes for the separation and fractionation of polydisperse, particulate, single-phase, and multiphase systems; multiphase flow and thermal separation processes; selected fluid machinery; process design and project implementation.
- Business Economics: fundamentals of corporate organisation; business accounting; human resources management; financing, investment planning, and controlling.
- Chosen specialisation 1: Plant and Process Technology: planning, construction, and operation of plants; fundamentals of applied analytics; fluid mechanics and heat transfer; properties of mixtures and interfaces; reaction engineering; modelling and simulation.
- Chosen specialisation 2: Bio-Based Materials and Paper Technology: analysis of biobased materials; forming and processing of biobased materials; key process steps in lignocellulose biorefineries; paper, pulp, and fibre technology.
- Depending on their choice of specialisation, they will have acquired in-depth knowledge in several of the following subject areas: green engineering and energy, bio-based materials and paper technology, pharmaceutical engineering and biotechnology, environmental and process technology.

Application of knowledge

Graduates are able to

- identify, adapt, and implement suitable technologies to solve problems in the field of chemical and process engineering.
- efficiently apply scientific methods to analyse and evaluate processes.
- apply fundamental methods of plant engineering.
- design, operate, and optimise plants for the production of a wide variety of products.
- support the cooperation of experts from a variety of fields with their expertise and use this expertise to further develop processes.
- identify, formulate, plan, and present solutions to a problem in an industrial and academic environment.
- work independently, critically analyse, and generate new ideas based on a thorough scientific education.
- recognise the potential uses of research results and integrate them into their own work, or conduct further research themselves.
- consider applicable guidelines in a wide variety of industries and effectively participate in regulation-oriented processes.

Evaluation and assessment

Graduates are able to

- handle complex situations that require interdisciplinary collaboration.
- formulate scientifically well-founded assessments of the technical use of resources, even on the basis of incomplete or limited information.
- reflect on their own work and continuously incorporate relevant information into their own actions.

Communicative, organisational and social skills

Graduates are able to

- write academic and scientific texts.
- acquire new knowledge independently.
- work independently and motivate themselves and others.
- act as a link between different disciplines in an interdisciplinary environment.
- combine ecological, economic, and societal aspects with engineering topics.
- present complex scientific relationships and results in a form that is understandable to an audience of both specialists and non-specialists.

(3) Need and relevance of the degree programme for science and the labour market

The field of chemical and process engineering focuses on the technical and economic implementation of all processes in which substances are modified according to their type, properties, and composition. This subject area is therefore integral in almost all areas of industry and production. Graduates are qualified to work in:

- the food and beverage industry,
- the paper industry,
- the plastics industry,
- the petrochemical industry,
- chemical manufacturing,
- the pharmaceutical industry,
- the electronics industry,
- biotechnology,
- industrial environmental protection.

In these fields, they are qualified to work in:

- research and development,
- planning and design,
- customer service and sales,
- technical monitoring, and
- construction and commissioning of industrial plants.

The master's degree programme also provides students with the skills required for independent scientific work within the framework of a doctoral programme.

§ 2 Admission requirements

(1) The Master's Degree Programme Chemical and Process Engineering builds upon the content of the Bachelor's Degree Programme Chemical and Process Engineering of Graz University of Technology. Graduates of this programme thus fulfil the admission requirements for the Master's Degree Programme Chemical and Process Engineering. Furthermore, the following degree programmes are eligible for admission to the Master's Degree Programme Chemical and Process Engineering without further requirements:

Any bachelor's degree programmes in

- Chemical Engineering
- Chemical and Process Engineering
- Chemical and Process Engineering

at another Austrian, German or Swiss university.

(2) Any degree programmes that are not mentioned in (1) are considered eligible for admission if at least 140 ECTS credit points have been positively completed in the following subject areas:

a. at least 40 ECTS credit points from courses on natural sciences (mathematics, physics)
b. at least 50 ECTS credit points from courses on engineering sciences
c. at least 20 ECTS credit points from courses in chemistry
d. at least 10 ECTS credit points from courses in computer-aided data processing

(3) Any degree programmes that are not mentioned in (1) and that do not meet the requirements of (2) are not considered equivalent to a subject-related degree programme. If at least 110 ECTS credit points have been completed in three or more of the subject areas mentioned in (2), full equivalence may be established by requiring supplementary examinations. Additional completion of supplementary examinations may be required to the extent of a maximum of 30 ECTS credit points. Supplementary examinations worth a maximum of 5 ECTS credit points may be recognised as free-choice subjects for this master's degree programme.

(4) Any degree programmes that are not mentioned in (1) and do not meet the requirements of (2) and (3) are not close enough in subject matter to establish full equivalency. In such cases, admission to the Master's Degree Programme Chemical and Process Engineering is not possible.

(5) Proof of sufficient English language skills is a prerequisite for admission to the degree programme. The type of proof required is specified in a regulation issued by the Rectorate.

§ 3 Structure of the degree programme

(1) The Master's Degree Programme Chemical and Process Engineering with a total workload of 120 ECTS credit points comprises four semesters and is structured into modules as follows:

	ECTS
Compulsory Module A: Chemical and Process Engineering Advanced Fundamentals	12.5
Compulsory Module B: Business Economics	7.5
Compulsory Module C: Design Exercise	8
Specialisation 1: Plant and Process Technology	
Compulsory Module 1-D: Applied Analytics Basics	5
Compulsory Module 1-E: Fluid Mechanics, Heat Transfer and Fluid Phase Properties	8
Compulsory Module 1-F: Chemical Reaction Engineering and Lab Courses	9
Compulsory Module 1-G: System Dynamics and Simulation	8
Specialisation 2: Bio-Based Materials and Paper Technology	
Compulsory Module 2-D: Chemistry of Bio-Based Materials	5
Compulsory Module 2-E: Bioresources: Properties, Processes, Products	9
Compulsory Module 2-F: Paper Production I	7
Compulsory Module 2-G: Paper Production II	9
Elective Module H	15
Elective Module I	11
Master's thesis	30
Free-choice subjects	6
Total	120

(2) In order to ensure that a bachelor's degree programme and subsequent subject-related master's degree programme combined comprise a total workload of 300 ECTS credit points, one and the same course cannot be recognised for both the bachelor's degree programme qualifying the student for admission to a master's degree programme, and the master's degree programme in question.

§ 4 Group sizes

The following maximum numbers of participants (group sizes) have been established:

Lecture (VO) Lecture part of lecture with integrated exercises (VU)	no restriction
Exercise (UE) Exercise part of lecture with integrated exercises (VU)	25
Laboratory course (LU)	6
Seminar (SE)	20

§ 5 Guidelines for the allocation of places in courses

(1) If the number of students exceeds the number of available places, students are allocated places on a course according to the following priority criteria, whereby the individual criteria are to be applied in the order given:

a. Position of the course in the curriculum (acc. to § 6 and § 7): Priority is given to students for whom the course is compulsory according to their curriculum over those who are taking the course as part of an elective module or free-choice subject.

b. Total of completed/recognised ECTS credit points for the degree programme: All study achievements completed in the degree programme for which the student wants to take the course are taken into account for the ranking. Students with the highest total of ECTS credit points already completed in their current degree programme are ranked preferentially.

c. Number of semesters spent studying the degree programme so far: Students are ranked according to the number of semesters they have already studied in the degree programme. Priority is given to those who have studied for longer.

d. Decision by lot: If it is not possible to rank students according to the above criteria, admission to the course is decided by lot.

(2) Up to 10% of the existing places on the course are reserved for students completing part of their studies at TU Graz as part of a mobility programme.

II. Degree Programme Content and Structure

§ 6 Modules, courses and semester assignment

The individual courses of this master's degree programme and their designation as compulsory and elective modules are explained in detail below.

The compulsory modules are subdivided into a general module group (Compulsory Modules A–C) and the chosen specialisation – either the specialisation in *Plant and Process Design* (Compulsory Modules 1–D to 1–G) or the specialisation in *Bio-Based Materials and Paper Technology* (Compulsory Modules 2–D to 2–G).

The elective modules are subdivided into Elective Module H, for which 15 ECTS credit points must be completed from one of the elective module catalogues in § 7 (1), and a general Elective Module I, for which 11 ECTS credit points must be completed from the entire pool of elective module catalogues and the specialisation the student did not choose. Certain courses in the elective module are offered only in German; the language of the respective course title reflects the language of presentation.

The knowledge, methods or skills to be taught in each course are described in detail in Appendix I. The assignment of courses to particular semesters ensures that the sequence of courses is best able to build on prior knowledge and that the workload of an academic year does not exceed 60 ECTS credit points.

Master's Degree Programme Chemical and Process Engineering					**ECTS credit points per semester**			
	Course	**SSt**	**Type**	**ECTS**	**I**	**II**	**III**	**IV**
Compulsory Module A: Chemical and Process Engineering Advanced Fundamentals								
A.1	Particle Technology II	3	VU[1]	4	4			
A.2	Mass Transfer Unit Operations II	2	VO	3	3			
A.3	Mass Transfer Unit Operations II	1	UE	1.5	1.5			
A.4	Plant and Process Design	3	VO	4		4		
Subtotal Compulsory Module A		**9**		**12.5**	**8.5**	**4**		
Compulsory Module B: Business Economics								
B.1	Encyclopaedia Business Economics	3	VO	4.5		4.5		
B.2	Encyclopaedia Business Economics	2	UE	3		3		
Subtotal Compulsory Module B		**5**		**7.5**		**7.5**		
Compulsory Module C: Design Exercise								
C.1	Design Exercise	4	KU	8			8	
Subtotal Compulsory Module C		**4**		**8**			**8**	
Total of Compulsory Modules		**18**		**28**	**8.5**	**11.5**	**8**	
Specialisation 1: Plant and Process Technology								
Compulsory Module 1-D: Applied Analytics Basics								
1-D.1	Basics of Applied Analytical Chemistry	3	VU[1]	3	3			
1-D.2	Basics of Applied Analytical Chemistry	3	LU	2	2			

Master's Degree Programme Chemical and Process Engineering					ECTS credit points per semester			
	Course	SSt	Type	ECTS	I	II	III	IV
Subtotal Compulsory Module 1-D		**6**		**5**	**5**			
Compulsory Module 1-E: Fluid Mechanics, Heat Transfer and Fluid Phase Properties								
1-E.1	Fluid Mechanics and Heat Transfer II	2	VO	3	3			
1-E.2	Fluid Mechanics and Heat Transfer II	1	UE	2	2			
1-E.3	Fluid Phase Properties	3	VU[2]	3	3			
Subtotal Compulsory Module 1-E		**6**		**8**	**8**			
Compulsory Module 1-F: Chemical Reaction Engineering and Lab Courses								
1-F.1	Particle Technology Laboratory II	2	LU	2	2			
1-F.2	Mass Transfer Unit Operations Laboratory II	2	LU	2	2			
1-F.3	Chemical Reaction Engineering II	2	VU[1]	3		3		
1-F.4	Chemical Reaction Engineering Laboratory II	2	LU	2		2		
Subtotal Compulsory Module 1-F		**8**		**9**	**4**	**5**		
Compulsory Module 1-G: System Dynamics and Simulation								
1-G.1	System Dynamics and Basics of Process Technology	2	VU[1]	3		3		
1-G.2	Model Development and Simulation	4	VU[2]	5			5	
Subtotal Compulsory Module 1-G		**6**		**8**		**3**	**5**	
Subtotal Specialisation 1		**26**		**30**	**17**	**8**	**5**	**0**

1: 2/3 semester course hours lecture part, 1/3 semester course hours exercise part.
2: 1/2 semester course hours lecture part, 1/2 semester course hours exercise part.

Master's Degree Programme Chemical and Process Engineering					ECTS credit points per semester			
	Course	SSt	Type	ECTS	I	II	III	IV
Specialisation 2: Bio-Based Materials and Paper Technology								
Compulsory Module 2-D: Chemistry of Bio-Based Materials								
2-D.1	Bio-Based Materials: Processing, Engineering and Analysis	2	VO	3			3	
2-D.2	Materials Chemistry	1.33	VO	2		2		
Subtotal Compulsory Module 2-D		**3.33**		**5**		**2**	**3**	
Compulsory Module 2-E: Bioresources: Properties, Processes, Products								
2-E.1	Bioresources	4	SE	4		4		
2-E.2	Lignocellulosic Biorefinery Processes	1.5	VO	2	2			
2-E.3	Lignocellulosic Biorefinery Laboratory	3	LU	3		3		
Subtotal Compulsory Module 2-E		**8.5**		**9**	**2**	**7**		
Compulsory Module 2-F: Paper Production I								
2-F.1	Paper Structure and Properties	1.5	VO	2	2			
2-F.2	Stock Preparation and Chemical Additives	3.5	VO	5	5			
Subtotal Compulsory Module 2-F		**5**		**7**	**7**			

Compulsory Module 2-G: Paper Production II								
2-G.1	Paper and Board Production	3.5	VO	5		5		
2-G.2	Paper and Coating Technology Laboratory	2	LU	2			2	
2-G.3	Process Integration and Industrial Digitisation	2	VU[2]	2		2		
Subtotal Compulsory Module 2-G		**7.5**		**9**		**7**	**2**	
Subtotal Specialisation 2		**24.33**		**30**	**9**	**16**	**5**	**0**
Subtotal Compulsory Modules[3]		**44**	**0**	**58**	**25.5**	**19.5**	**13**	**0**
		42.33	**0**	**58**	**17.5**	**27.5**	**13**	**0**
Elective Module H				15	2.5	5.5	7	
				15	7	0.5	7.5	
Elective Module I				11		3	8	
				11	3.5		7.5	
Total Elective Modules acc. to § 7				**26**	**2.5**	**8.5**	**15**	
				26	**10.5**	**0.5**	**15**	
Master's thesis				**30**				**30**
Free-choice subjects acc. to § 8				**6**	**2**	**2**	**2**	
Overall total				**120**	**30**	**30**	**30**	**30**

1: 2/3 semester course hours lecture part, 1/3 semester course hours exercise part.
2: 1/2 semester course hours lecture part, 1/2 semester course hours exercise part.
3: The subtotal of semester course hours and ECTS credit points per semesters of the compulsory module depends on the chosen specialisation.

§ 7 Elective modules

(1) For Elective Module H, at least 15 ECTS credit points worth of courses from the following course catalogues must be completed.

Elective Module Catalogue H-1: Green Engineering and Energy				**Semester allocation**	
Course	**SSt**	**Type**	**ECTS**	**WS**	**SS**
Introduction to Green Process Engineering	1.5	VO	2.5	2.5	
Green Chemistry and Technology	1.33	VO	2		2
Thermal Conversion Routes for Energetic Biomass Utilisation I	2	VO	3	3	
Fundamentals of Electrical Power Systems GPE	2	VO	3		3
Bioresources	4	SE	4		4
Bioresource Process Technologies	4	VU	5	5	
Green Process Engineering Project	6	PT	6	6	(6)**
Energy Storage and Conversion	1.33	VO	2		2
Fuel Cells and Energy Storage	2	VO	3		3
Hydrogen Production and Storage	2	VO	3	3	
Advanced Studies of Polymer Electrolyte Fuel Cells	3	VU[1]	4		4
Photovoltaics, Thermal Energy Storage and Application	1.33	VO	2		2
Electrochemical Engineering	2	SE	2	2	
Electrochemical Surface Refinement	2	VO	3	3	
Bio-Based Circular Economy	2	VU[1]	3	3	

Elective Module Catalogue H-2: Bio-Based Materials and Paper Technology				Semester allocation	
Course	**SSt**	**Type**	**ECTS**	**WS**	**SS**
Carbohydrate Chemistry	2	VO*	3		3
Bio-Based Materials: Processing, Engineering and Analysis	4	LU	3	3	
Mikrobiologische Prozesse in der P&Z	2	VO*	3		3
Papierrecycling VA	2	VO*	2		2
Sustainable Lignocellulosic Packaging Materials	2	SE*	3	3	
Paper Coating Technologies	3	VO	4.5	4.5	
Excursion Pulp and Paper	2	EX	2		2
Converting and Finishing	1.5	VO	2	2	
Sustainable Fibre Based Building Materials	2	SE*	3		3
Nanocellulose Processes and Products	1.5	VO	2	2	
Bioresource Process Technologies	4	VU[1]	5	5	
Pulp and Paper Technology - Selected Topics	2	SE	2	2	(2)**
Carbohydrate Technologies	1.33	VU[3]	2		2
Green Process Engineering Project	6	PT	6	6	(6)**

Elective Module Catalogue H-3: Pharmaceutical Engineering and Biotechnology				Semester allocation	
Course	**SSt**	**Type**	**ECTS**	**WS**	**SS**
Pharmaceutical Engineering I	3	VU[1]	4	4	
Pharmaceutical Engineering II	3	VU[1]	4		4
Pharmaceutical Process and Plant Engineering	2.66	VO	3	3	
Laboratory Course – Pharmaceutical Engineering I	3	LU*	3		3
Design of Drug Formulations	2.66	VO	4	4	
Quality by Design	1.33	VO	2	2	
Pharmaceutical Process Control and Process Analysis	2	VO	3		3
Continuous Process Engineering	2	VO	3		3
Modelling and Simulation of Pharmaceutical Manufacturing Operations	2	VO	3		3
Bioprocess Technology I	2	VO	3	3	
Bioprocess Technology II	2	VO	3		3
Protein Technology	2	VO	3		3
Laboratory Course Special Pharmaceutical Ingredients and Fine Chemicals	3	LU*	3		3
Selected Topics of Pharmaceutical Engineering	2	VO	3	3	(3)**
Design of Multiphase Flow Processes	2	VU[1]	3		3

Elective Module Catalogue H-4: Environmental and Process Technology				Semester allocation	
Course	**SSt**	**Type**	**ECTS**	**WS**	**SS**
Environmental Technologies	3	VO	4	4	
Off-Gas Purification Processes	3	VU[1]*	4		4
Umweltmanagement Verfahrenstechnik	2	VO	2		2
Produktionsintegrierter Umweltschutz	2	VU[1]*	3	3	
Wastewater Treatment	3	VU[1]*	4	4	
High Pressure and Supercritical Fluid Processes	2	SE	2		2
High-Pressure Intensive Course	5	SE	5		5
Advanced Chemical Reaction Engineering	3	VU[1]*	4		4

Elective Module Catalogue H-4: Environmental and Process Technology				Semester allocation	
Course	**SSt**	**Type**	**ECTS**	**WS**	**SS**
Advanced Chemical Reaction Engineering Laboratory	2	LU	2	2	
Strömungsmechanik und Stoffaustausch VA	3	VU[1]	4		4
Milli and Micro Fluid Mechanics	2	VU[1]	3		3
Pumpen und Verdichter Rechenübungen	1	UE	1		1
Anlagengenehmigungsverfahren	2	SE	3		3
Safety and Environmental Aspects in Chemical Process Engineering	2	VO	3	3	
Design of Multiphase Flow Processes	2	VU[1]	3		3
Bioethanolveredelung	1	PT	2	2	
Environmental Technologies Laboratory	2	LU*	2		2

(2) For the general Elective Module I, courses totalling 11 ECTS credit points must be selected from the following catalogue, and/or from the Elective Module Catalogues H–X, and/or from the specialisation not chosen.

Extended Elective Module Catalogue I				Semester allocation	
Course	**SSt**	**Type**	**ECTS**	**WS**	**SS**
Communication Skills for Chemical Engineers	2	SE	2	2	
Wärmetechnik I	2	VO	3	3	
Wärmetechnik II	2	VO	3		3
Exkursion Verfahrenstechnik	2	EX	2		2
Beurteilung von Finanzzahlen	3	VO	4		4
Visual Basic CE	2	VU[3]	3	3	
Industry Excursion Green Process Engineering	1	EX	1		1
Quality Assurance in Pharmaceutical, Food and Biotechnological Processing	2	VO	3	3	
REACH - Registration, Evaluation, Authorisation and Restriction of Chemical Substances	2	VO	3		3
Solid Biomass for Thermal Energy	2	VO*	3	3	
Energy Management in Industries	2	VU[1]	3	3	
Tutorial Fluid Mechanics and Heat Transfer II	2	UE	2	2	
Life Cycle Assessment GPE	3	SP	4	4	
General Management and Organisation	2	VO	3		3
General Management and Organisation	2	UE	3		3
Bürgerliches Recht und Unternehmensrecht	3	VO	4.5	4.5	
Technikfolgenabschätzung	2	SE	4	4	4
Gender and Diversity in Research and Inclusive Design	2	VU[2]	2	2	
Applied Flow Chemistry: Design and Operation of Continuous Processes	3	LU	3	3	
Optimisation and Control	2	VO	3	3	
Optimisation and Control, Laboratory	1	LU	1.5	1.5	

1: 2/3 semester course hours lecture part, 1/3 semester course hours exercise part.
2: 1/2 semester course hours lecture part, 1/2 semester course hours exercise part.
3: 1/3 semester course hours lecture part, 2/3 semester course hours exercise part.
*: The course is offered every other academic year.
**: The course may also be offered in this semester.

§ 8 Free-choice subjects

(1) The courses to be completed as part of the free-choice subjects in the Master's Degree Chemical and Process Engineering are designed to provide an individual strategic focus and further development of the students. They may be freely selected from the courses offered by any recognised national or international universities and also recognised national or international post-secondary educational institutions. Appendix II contains a list of recommended free-choice subjects.

(2) If a specific free-choice course does not have an allocation of ECTS credit points, each semester hour (SSt) of this course is counted as one ECTS credit point. However, if such courses are lecture-type courses (VO), they are assigned 1.5 ECTS credit points for each semester course hour.

(3) Additionally, the possibility exists, in accordance with § 11, to complete a professionally-oriented internship or short study period abroad as part of the free-choice subjects for up to 6 ECTS credit points.

§ 9 Master's thesis

(1) The purpose of the master's thesis is to demonstrate a student's ability to work on scientific topics on their own, both with regard to content and methodology. The scope of the master's thesis must be determined in such a way that its completion can be reasonably and feasibly accomplished by the student within a period of six months.

(2) The topic of the master's thesis must be taken from or meaningfully related to the compulsory modules or the elective modules in accordance with § 6 and § 7.

(3) The master's thesis must be registered with the respective officer responsible for study matters via the Dean's Office before beginning work on it.

§ 10 Registration requirements for courses/examinations

To register for the final master's examination before a committee, the student must provide proof of positive assessment of all study achievements/examinations outlined in § 6 to § 8 as well as positive assessment of the master's thesis.

§ 11 Stays abroad and internships

(1) Recommended stays abroad

Students are recommended to complete a stay abroad during their degree programme.

It is also possible to obtain recognition of work done during shorter stays abroad, for example while participating in summer or winter schools, as part of the free-choice subjects, by application to the officer responsible for study matters.

(2) Internships

It is possible to include professionally-oriented internships/work experience in the free-choice subjects.

Each week of full employment corresponds to 1.5 ECTS credit points. Active participation in an academic event may also count as an internship. This internship must be approved by the officers responsible for study matters and considered a useful addition to the degree programme.

III. Examination Regulations and Conclusion of Studies

§ 12 Assessment of modules

The overall grade for a module is the average grade of all examinations completed as part of the module, weighted according to ECTS credit points. The grade is rounded up if the decimal place exceeds 0.5. Otherwise, the grade is rounded down. Examinations that are assessed only as "successfully completed/not completed" are not included in the calculation of the overall module assessment. Positive assessment of a module requires the positive assessment of all individual examinations to be completed within the module.

§ 13 Master's examination

(1) The master's examination is an oral examination before a committee and consists of

- the presentation of the master's thesis (max. 25 minutes),
- the defence of the master's thesis (examination interview on the subject matter of the master's thesis and other subject-related areas, max. 50 minutes).

(2) The master's thesis is assigned to a compulsory or elective subject by the officer responsible for study matters based on the candidate's suggestion. The total duration of the master's examination before a committee is usually 60 minutes and must not exceed 75 minutes.

(3) The examination committee for the master's examination includes the supervisor of the master's thesis and two other members who are nominated by the officer responsible for study matters, based on recommendations from the candidate. The examination committee must be chaired by one of the members who is not the supervisor of the master's thesis.

(4) The master's examination is graded by the committee based on the performance during the examination.

§ 14 Completion of studies

(1) The master's degree programme is completed once all academic achievements pursuant to 0 have been assessed positively.

(2) Successful completion of the degree programme is documented by issuing a certificate. The master's degree certificate for the Master's Degree Programme Chemical and Process Engineering is composed of:

a. the chosen specialisation,
b. a list of all completed modules set out in 0 (along with their ECTS credit points) and their assessments,
c. the title and assessment of the master's thesis,
d. the assessment of the master's examination,
e. the total in ECTS credit points completed in free-choice subjects, as defined in § 8, and
f. the overall assessment.

IV. Entry Into Force and Transitional Provisions

§ 15 Entry into force

This 2025 curriculum shall enter into force on 1 October 2025.

§ 16 Transitional provisions

Students of the Master's Degree Programme Chemical and Process Engineering who are subject to the 2017 curriculum in its 2022 version when this curriculum enters into force on 1 October 2025, are entitled to complete their studies according to the provisions of the 2017 curriculum in its 2022 version by 30 September 2028. If the degree programme is not completed by 30 September 2028, students become subject to the curriculum as amended. Students are entitled to voluntarily opt for the new curriculum at any time within the admission periods. To this end, an irrevocable written declaration must be sent to the officer responsible for study matters. The equivalence between those examinations completed within the framework of the curriculum version 2017 and those completed within the framework of the curriculum version 2025 is established in Appendix IV: Equivalence List.

Appendices to the curriculum of the Master's Degree Programme Chemical and Process Engineering

Appendix I: Module Descriptions

Compulsory Module A	**Chemical and Process Engineering Advanced Fundamentals**
ECTS credit points:	12.5
Contents:	Processes relevant to chemical and process engineering with a focus on technical separation processes of polydisperse particulate or multiphase systems. In addition to an overview of multiphase flows and thermal separation processes, the module covers the following topics: • Sedimentation • Electrostatic precipitation • Flotation • Filtration • Calculation and design methods (separation stage concept, HTU-NTU) for absorption, distillation, drying, and extraction • Apparatus implementations of the processes • Fundamentals of process development; planning, construction, and operation of plants • Environmental concepts • Basic and detailed plant engineering
Learning outcomes:	After completing this module, students are able to • assess the limitations of individual separation processes. • apply the calculation methods and standards of separation processes. • quantify basic physical processes (using models). • design simple apparatus and interpret test results.
Prerequisites for participation:	Particle Technology I or equivalent course, Mass Transfer Unit Operations or equivalent course
Frequency in which the module is provided:	Every academic year

Compulsory Module B:	**Business Economics**
ECTS credit points:	7.5
Contents:	• Fundamentals of corporate organisation • Business accounting • Fundamentals of production, purchasing, and marketing • Human resources management • Financing, investment, and controlling
Learning outcomes:	After completing this module, students are able to • understand the key techno-economic issues within companies. • apply business administration as an important management tool and aid in visualising the complexity of real-world business.

Prerequisites for participation:	none
Frequency in which the module is provided:	Every academic year

Compulsory Module C:	**Design Exercise**
ECTS credit points:	8
Contents:	• Project implementation • Process design • Material and energy balancing • Basic and detailed engineering • Contract processing • Scheduling • Economic viability analysis
Learning outcomes:	After completing the module, students are able to • apply basic plant engineering methods to specific problems and tasks.
Prerequisites for participation:	none
Frequency in which the module is provided:	Every semester

Compulsory Module 1-D:	**Applied Analytics Basics**
ECTS credit points:	5
Contents:	• Recording and development of the analytical process from sampling to methodology to analysis, including analytical parameters • Standard wet chemical methods: gravimetry, volumetry • Fundamental knowledge of electrochemistry • UV-Vis spectrometry • Atomic spectrometry • Partitioning methods • Chromatography • Surface analysis • Fundamental knowledge of optical chemical sensors • X-ray fluorescence analysis
Learning outcomes:	After completing this module, students are able to • apply the most important methods of analytical chemistry and assess their performance.
Prerequisites for participation:	Fundamental knowledge of general chemistry
Frequency in which the module is provided	Every academic year

Compulsory Module 1-E:	**Fluid Mechanics, Heat Transfer and Fluid Phase Properties**
ECTS credit points:	8
Contents:	Review of the fundamentals of flow description with a focus on: • Conservation laws for mass, momentum, and energy • Similarity principle, dimensionless indices • Flow at low Reynolds numbers, motion of solid bodies, bubbles, and droplets in a fluid during creeping flow • Flow at high Reynolds numbers, Bernoulli's theorem, Crocco's vortex theorem

	• Comparison of potential flow and real flow • Boundary layer theory, free jets, laminar velocity boundary layer, temperature boundary layer • Empirical relationships for determining convective heat transfer • Stability of viscous flows, Orr-Sommerfeld equation • Turbulence, critical Reynolds number, turbulent velocity boundary layer, turbulent technical flows, flow measurement technology • Free-surface flows, channel flows, multiphase flows • Heat transfer with phase changes, boiling, condensation • Models for estimating material properties for equilibrium calculations and reaction equilibria • Work with measurement data and material databases • Regression of model parameters and parameter optimisation • Mixing rules and thermodynamic models for complex mixtures • Models for transport properties and surface tension • Thermodynamics of the phase boundary for drops, bubbles, and particles • Molecular and electrostatic interactions between phase boundaries; influence of the phase boundary on technical processes
Learning outcomes:	After completing this module, students are able to • understand the transport of mass, momentum, and energy and the underlying physical mechanisms. • classify the differences between flows at low and high Reynolds numbers. • evaluate boundary layer phenomena and processes necessary for the advanced calculation of convective heat transfer. • calculate flows with free surfaces. • calculate heat transfer with phase changes and heat exchangers. • identify problems and select appropriate analytical or empirical approaches for specific tasks. • acquire or estimate the material data used in chemical and process engineering.
Prerequisites for participation:	Fluid Mechanics and Heat Transfer I or equivalent course, Chemical Thermodynamics
Frequency in which the module is provided:	Every academic year

Compulsory Module 1-F:	**Chemical Reaction Engineering and Lab Courses**
ECTS credit points:	9
Contents:	• Parameter estimation and analysis of kinetic models • Development of the reaction engineering fundamentals of heterogeneous and heterogeneous-catalytic reactions • Reactor dynamics and stability • Safety aspects of chemical reactors • Practical implementation of heterogeneous and heterogeneous-catalytic reactions on a laboratory scale

	• Deepening practical experience in the basic thermal operations of liquid-liquid extraction, absorption, and drying • Exercises on laboratory equipment with a focus on the rheology of granular systems, screening, and flow through bulk materials or fluidised beds
Learning outcomes:	After completing this module, students are able to • independently address complex questions in reaction engineering through systematic development of the core discipline of every production process. • select and parameterise kinetic models for chemical reactions. • dimension reactors for homogeneous, heterogeneous, and catalytic reactions, taking safety aspects into account. • supervise experimental setups, evaluate experiments, and prepare laboratory reports. • clearly illustrate and present their test results and findings.
Prerequisites for participation:	For the laboratory exercises, attendance of the corresponding lectures or exercises as well as passing of an aptitude test are required
Frequency in which the module is provided:	Every academic year

Compulsory Module 1-G:	**System Dynamics and Simulation**
ECTS credit points:	8
Contents:	Introduction to the theory of dynamic systems as a starting point for measurement and control technology and dynamic process simulation, as well as theoretical foundations for modelling and simulation in the field of process engineering. Topics covered include: • Theoretical modelling • Theory of dynamic systems • Fundamentals of numerical simulation • Nonlinear dynamics and bifurcation analysis • Chaos theory • Control engineering for nonlinear systems • Simulation of molecular systems (Monte Carlo and molecular dynamics)
Learning outcomes:	After completing this module, students are able to • create models of process engineering plants and systems. • understand and apply numerical methods (possibilities and limitations of applicability) to solve model equations, including partial differential equations. • evaluate and effectively use numerical tools for computer simulation (e.g., in the field of CFD and molecular simulation). • analyse simple nonlinear systems and to characterise their behaviour.
Prerequisites for participation:	none
Frequency in which the module is provided:	Every academic year

Compulsory Module 2-D:	Chemistry of Bio-Based Materials
ECTS credit points:	5
Contents:	• Analytical methods: theoretical and practical introduction to direct analytical methods for the identification and characterisation of bio-based materials • Overview of the major classes of bio-based materials and possibilities for modifying these materials • Material classes: polysaccharides and oligosaccharides, proteins, DNA, polyamides, and polyesters
Learning outcomes:	After completing this module, students are able to • apply basic and advanced analytical methods for bio-based materials. • explain the main modification methods for bio-based materials. • explain the major classes of bio-based materials and their respective production routes. • explain chemical modification routes for the functionalisation of bio-based materials.
Prerequisites for participation:	Fundamental knowledge of chemistry and analytics
Frequency in which the module is provided:	Every academic year

Compulsory Module 2-E:	Bioresources: Properties, Processes, Products
ECTS credit points:	9
Contents:	• Definitions and an overview of the current state of biorefineries • Main components of lignocellulosic value chains • Overview of the availability and composition of biomass from lignocellulose • Special features, properties, and technical utilisation possibilities of the main crops • Wood treatment and wood processing, alternative raw materials • Pulp production; processes, procedures, technology, areas of application • Key process steps of the lignocellulosic biorefinery • Regenerated fibre processes
Learning outcomes:	After completing this module, students are able to • describe the main types of biorefineries. • describe the value chain of the lignocellulosic biorefinery. • understand various pulping processes and their corresponding effects on products and raw materials. • understand the essential basic operations of processing lignocellulosic materials.
Prerequisites for participation:	none
Frequency in which the module is provided:	Every academic year

Compulsory Module 2-F:	Paper Production I
ECTS credit points:	7
Contents:	• Paper physics: fibre orientation, formation, fibre-fibre bonding, paper rheology, mechanical properties, optical properties • Paper testing (common test methods for mechanical, optical, and structural paper properties) • Preparation and treatment of primary fibres used in paper production (pulping, screening, refining) • Waste paper pulping, deinking, bleaching, dispersing,cleaning using pressure screens and cleaners
Learning outcomes:	After completing this module, students are able to • describe the fundamental relationships of paper physics and classify their effects on product properties. • describe common methods for assessing mechanical, optical, and structural paper properties, as well as their context in paper physics. • describe the preparation and use of fibre raw materials and auxiliaries for paper production.
Prerequisites for participation:	none
Frequency in which the module is provided:	Every academic year

Compulsory Module 2-G:	Paper Production II
ECTS credit points:	9
Contents:	• Use and properties of mineral additives • Approach flow of the paper machine • Dimensioning of a paper or board machine • Control of a paper machine • Technology and techniques for surface treatment of paper and board, introduction to printing technology • Rheological properties of coating colours • Raw materials for coating; coating pigments, binders (synthetic + native), additives • Application and dosing systems for coating colours • Calendering and calendering technology • Static balancing of material and water flows in stock preparation and approach flow • Modelling and simulation of dynamic processes in paper and pulp production
Learning outcomes:	After completing this module, students are able to • describe the technological interrelationships in paper production. • classify the requirements for selected paper grades and derive the resulting consequences for the machine design. • describe processing and finishing methods that follow the paper machine. • create basic models for the simulation of process engineering processes in paper and pulp technology.

Prerequisites for participation:	none
Frequency in which the module is provided:	Every academic year

Elective Module Catalogue H-1:	**Green Engineering and Energy**
ECTS credit points:	15
Contents:	The courses included in this module catalogue cover various aspects of sustainable engineering, renewable energies, and environmentally friendly technologies. Subject areas such as green chemistry, bioresources, and bio-based process technologies form the basis for sustainable processes. Methods for energy generation and storage are also covered, including hydrogen technologies, fuel cells, photovoltaics, and electrochemical processes. The content is expanded with courses in related subject areas such as circular economy concepts and practice-oriented projects in the field of green process engineering.
Learning outcomes:	Depending on the chosen content, students are able to • understand and apply fundamental principles of sustainable engineering and green chemistry. • analyse and sustainably design concepts of bioresource utilisation and bio-based process technologies. • evaluate and optimise methods of thermal and electrochemical energy conversion and energy storage for technical applications. • analyse and further develop hydrogen technologies, fuel cells, and photovoltaic systems with regard to efficiency and sustainability. • use electrochemical processes and surface finishing for industrial applications. • understand concepts of the bio-based circular economy and apply them to conserve resources. • develop sustainable processes in practical projects and to develop interdisciplinary solutions for environmentally friendly technology design.
Prerequisites for participation:	none
Frequency in which the module is provided:	Every academic year

Elective Module Catalogue H-2:	**Bio-Based Materials and Paper Technology**
ECTS credit points:	15
Contents:	The courses included in this module catalogue cover chemical and process engineering for bio-based materials, particularly pulp and paper. Topics include chemical fundamentals, sustainable production and finishing technologies, and recycling processes. Microbiological processes, innovative applications such as nanocellulose, and sustainable packaging and construction materials are also covered.

	In addition, an excursion offers practical insights into the paper industry, while a green engineering project focuses on the development of environmentally friendly technologies.
Learning outcomes:	Depending on the chosen content, students are able to • understand and apply chemical and biological processes in materials processing. • use advanced technologies to optimise paper production, finishing, and recycling. • design and implement production processes in various industries, specifically for bio-based substances and materials. • design and implement innovative, environmentally friendly materials and processes in various industries.
Prerequisites for participation:	none
Frequency in which the module is provided:	Every academic year

Elective Module Catalogue H-3:	**Pharmaceutical Engineering and Biotechnology**
ECTS credit points:	15
Contents:	The courses included in this module catalogue cover a broad spectrum of topics in the field of pharmaceutical engineering. They address basic and advanced aspects of pharmaceutical process and plant engineering, including the planning and optimisation of production processes and the development of drug formulations. Students learn both the practical and theoretical concepts behind quality control and process design, applying methods such as “quality by design” and continuous process management. Other areas of focus include modelling and simulation of pharmaceutical manufacturing processes, biotechnology and protein processing, as well as the development of specialty pharmaceutical active ingredients and fine chemicals. Practical experience is complemented by laboratory internships.
Learning outcomes:	Depending on the chosen content, students are able to • design, optimise, and control pharmaceutical production processes, applying both batch and continuous process methods. • develop drug formulations, integrating the principles of “quality by design” to ensure product quality. • understand and apply biotechnological processes and protein production technologies to manufacture biopharmaceutical products. • conduct simulations and modelling of pharmaceutical manufacturing processes to increase efficiency and quality in production.
Prerequisites for participation:	none
Frequency in which the module is provided:	Every academic year

Elective Module Catalogue H-4:	Environmental and Process Technology
ECTS credit points:	15
Contents:	The courses included in this module catalogue cover a broad spectrum of topics in the field of environmental engineering and chemical process engineering. They include theoretical and practical aspects of exhaust gas purification, environmental management, and production-related environmental protection processes. Wastewater treatment, high-pressure processes, and supercritical fluid technologies are also discussed. Advanced courses cover chemical reaction engineering and fluid mechanics, including practical laboratory exercises. Furthermore, aspects of safety and environmental compatibility in chemical engineering, as well as the design of multiphase flow processes are addressed. Specialised topics such as bioethanol refinement and plant licensing procedures complete the course offerings. The courses thus provide a solid overview of modern technologies and the environmentally relevant aspects of chemical engineering.
Learning outcomes:	Depending on the chosen content, students are able to • understand and apply common processes for exhaust gas purification, wastewater treatment, and sustainable production environmental protection. • use high-pressure processes and supercritical fluids in industrial applications. • analyse and optimise complex chemical reactions and their processes. • consider and implement safety and environmental requirements in chemical processes. • plan and implement multiphase flow processes and integrate environmental aspects into process design.
Prerequisites for participation:	none
Frequency in which the module is provided:	Every academic year

Appendix II: Recommended Free-Choice Subjects

Students can choose free-choice courses as desired in accordance with § 8 of this curriculum.

For students to broaden their knowledge, courses in the fields of foreign languages, social competence, technological impacts assessment and women's and gender studies are recommended. In particular, the following institutions and service departments as well as the TU Graz certificate programme for key competencies are recommended:

- Languages, Key Competencies and In-House Training of TU Graz,
- Science, Technology and Society Unit (STS Unit) of TU Graz,
- Treffpunkt Sprachen – Centre for Language, Plurilingualism and Didactics at Uni Graz,
- the transfer initiative for management and entrepreneurship fundamentals, awareness, training and employability ("TIMEGATE"), and
- Centre for Social Competence of Uni Graz.

Appendix III: Equivalence List

(1) Equivalency of courses when switching from the expiring Master's Degree Programme Chemical and Process Engineering curriculum 2017 in the version of 2022 to the new curriculum version 2025

The courses of the current curriculum are listed on the left-hand side of the table. The corresponding equivalent courses in the expiring curriculum version of the Master's Degree Programme Chemical and Process Engineering are listed on the right-hand side of the table. Any courses of the expiring curriculum that have no equivalent course according to this list may be taken as free-choice subjects or as courses for the Elective Module I. In addition, it is possible to recognise an entire elective subject catalogue from the expiring curriculum within the framework of Elective Module H, provided that at least 15 ECTS credit points have been completed from this catalogue. If the total of ECTS credit points to be recognised in this way is higher than the number of ECTS credit points required for completion of the elective module, the difference may be recognised within the scope of the free-choice subjects.

Courses that have the same title and type, number of ECTS credit points and number of semester hours are considered to be equivalent and are thus not explicitly listed in the equivalence list.

Curriculum Chemical and Process Engineering in the version of 2025					**Expiring curriculum Chemical and Process Engineering in the version of 2022**				
	Course	Course type	ECTS	SSt		Course	Course type	ECTS	SSt
	Design Exercise	KU	8	4		Konstruktionsübung	KU	8	2
	Encyclopaedia Business Economics	VO	4.5	3		Enzyklopädie Betriebswirtschaftslehre	VO	4	3
	Encyclopaedia Business Economics	UE	3	2		Enzyklopädie Betriebswirtschaftslehre	UE	3	2
	Mass Transfer Unit Operations II	UE	1.5	1		Mass Transfer Unit Operations II	UE	1	1
	Basics of Applied Analytical Chemistry	VU	3	3		Grundlagen der Angewandten Analytik	VU	3	3
	Basics of Applied Analytical Chemistry	LU	2	3		Grundlagen der Angewandten Analytik	LU	2	3
	Fluid Mechanics and Heat Transfer II	VO	3	2		Strömungslehre und Wärmeübertragung II VT	VO	3	2
	Fluid Mechanics and Heat Transfer II	UE	2	1		Strömungslehre und Wärmeübertragung II VT	UE	2	1
	System Dynamics and Basics of Process Technology	VU	3	2		Systems Dynamic and Basics of Process Technology	VU	3	2
	Bioresource Process Technologies	VU	5	4		Chemical Engineering of Bio-Based Products	VU	4.5	3.5
	Fundamentals of Electrical Power Systems GPE	VO	2	3		Fundamentals of Electrical Power Systems for Biorefineries	VO	2	3

Curriculum Chemical and Process Engineering in the version of 2025					Expiring curriculum Chemical and Process Engineering in the version of 2022				
	Course	Course type	ECTS	SSt		Course	Course type	ECTS	SSt
	Paper Structure and Properties	VO	2	1.5		Physik des Papiers und Prüfverfahren	VU	2	2
	Stock Preparation and Chemical Additives	VO	5	3.5		Stoffaufbereitung und chemische Additive	VO	5	3.5
	Paper and Board Production	VO	5	3.5		Paper- und Kartonherstellung	VO	5	3.5
	Paper and Coating Technology Laboratory	LU	2	2		Labor Papier- und Streichtechnologie	LU	2	2
	Process Integration and Industrial Digitisation	VU	2	2		Prozessintegration und industrielle Digitalisierung	VU	2	2
	Bio-Based Materials: Processing, Engineering and Analysis	LU	3	4		Bio-Based Materials: Processing, Engineering and Analysis	LU	2	2
	Sustainable Lignocellulosic Packaging Materials	SE	3	2		Spezialprodukte auf Zellstoffbasis	VO	3	2
	Excursion Pulp and Paper	EX	2	2		Papiertechnisches Praktikum Papierfabrik	EX	2	2
	Converting and Finishing	VO	2	1.5		Papierverarbeitung	VO	2	1.5
	Pulp and Paper Technology - Selected Topics	SE	2	2		Papier- und Kartonherstellung VA	VO	3	2
	Sustainable Fibre Based Building Materials	SE	3	2		Nachhaltige faserbasierte Baustoffe	SE	2	2
	Visual Basic CE	VU	3	2		Visual Basic VT	VU	3	2
	Nanocellulose Processes and Products	VO	2	1.5		Nanocellulose Processes and Products	VO	1.5	1
	Off-Gas Purification Processes	VU	4	3		Luftreinhaltung / Abluftreinigung	VU	4	3
	Wastewater Treatment	VU	4	3		Chemisch- Thermische Abwasserreinigung	VU	4	3
	General Management and Organisation	VO	3	2		Unternehmensführung und Organisation	VO	3	2
	Industry Excursion Green Process Engineering	EX	1	1		Industry Excursion Biorefinery	EX	1	1
	Environmental Technologies Laboratory	LU	2	2		Labor Umwelttechnik	LU	2	2
	Bioresources	SE	4	4		Crop Bioresources - Characterisation and Properties	VO	3	2
						Lignocellulose Bioresources - Characterisation and Properties	VO	3	2
	Life Cycle Assessment GPE	VU	4	3		LCA of Bioresource Value Chains	VO	3	2
						LCA of Bioresource Value Chains	UE	1	1

Curriculum Chemical and Process Engineering in the version of 2025					Expiring curriculum Chemical and Process Engineering in the version of 2022				
	Course	Course type	ECTS	SSt		Course	Course type	ECTS	SSt
	Introduction to Green Engineering	VO	2.5	1.5		no equivalency			
	Green Chemistry and Technology	VO	2	1.33		no equivalency			
	Green Process Engineering Project	WS	6	6		no equivalency			
	Energy Storage and Conversion	VO	2	1.33		no equivalency			
	Hydrogen Production and Storage	VO	3	2		no equivalency			
	Advanced Studies of Polymer Electrolyte Fuel Cells	VU	4	3		no equivalency			
	Photovoltaics, Thermal Energy Storage and Application	VO	2	1.33		no equivalency			
	Electrochemical Engineering	SE	2	2		no equivalency			
	Electrochemical Surface Refinement	VO	3	2		no equivalency			
	Carbohydrate Technologies	VU	2	1.33		no equivalency			
	Modelling and Simulation of Pharmaceutical Manufacturing Operations	VO	3	2		no equivalency			
	Bioprocess Technology I	VO	3	2		no equivalency			
	Bioprocess Technology II	VO	3	2		no equivalency			
	Protein Technology	VO	3	2		no equivalency			
	Selected Topics of Pharmaceutical Engineering	VO	3	2		no equivalency			
	High-Pressure Intensive Course	SE	5	5		no equivalency			
	Tutorial Fluid Mechanics and Heat Transfer II	UE	2	2		no equivalency			
	Gender and Diversity in Research and Inclusive Design	VU	2	2		no equivalency			
	General Management and Organisation	UE	3	2		no equivalency			
	Paper Coating Technologies	VO	4.5	3		no equivalency			
	Optimisation and Control	VO	3	2		no equivalency			
	Optimisation and Control, Laboratory	LU	1.5	1		no equivalency			

Curriculum Chemical and Process Engineering in the version of 2025					Expiring curriculum Chemical and Process Engineering in the version of 2022				
	Course	Course type	ECTS	SSt		Course	Course type	ECTS	SSt
	Applied Flow Chemistry: Design and Operation of Continuous Processes	LU	3	3		no equivalency			

(2) Regulations for continuing with the expiring Master's Degree Programme Chemical and Process Engineering in the version of 2022

The courses of the expiring Master's Degree Programme Chemical and Process Engineering are listed on the left-hand side of the table. On the right side of the table is a list of courses from the new curriculum that may be completed instead of the courses originally listed in the curriculum if the student wishes to remain in the expiring curriculum and the original courses are no longer offered.

Courses that have the same title and type, number of ECTS credit points and number of semester hours are considered to be equivalent and are thus not explicitly listed in the equivalence list.

Expiring curriculum Chemical and Process Engineering in the version of 2022					**Curriculum Chemical and Process Engineering in the version of 2025**				
	Course	Course type	ECTS	SSt		Course	Course type	ECTS	SSt
	Konstruktionsübung	KU	8	2		Design Exercise	KU	8	4
	Enzyklopädie Betriebswirtschaftslehre	VO	4	3		Encyclopaedia Business Economics	VO	4.5	3
	Enzyklopädie Betriebswirtschaftslehre	UE	3	2		Encyclopaedia Business Economics	UE	3	2
	Mass Transfer Unit Operations II	UE	1	1		Mass Transfer Unit Operations II	UE	1.5	1
	Grundlagen der Angewandten Analytik	VU	3	3		Basics of Applied Analytical Chemistry	VU	3	3
	Grundlagen der Angewandten Analytik	LU	2	3		Basics of Applied Analytical Chemistry	LU	2	3
	Strömungslehre und Wärmeübertragung II VT	VO	3	2		Fluid Mechanics and Heat Transfer II	VO	3	2
	Strömungslehre und Wärmeübertragung II VT	UE	2	1		Fluid Mechanics and Heat Transfer II	UE	2	1
	Systems Dynamic and Basics of Process Technology	VU	3	2		System Dynamics and Basics of Process Technology	VU	3	2
	Chemical Engineering of Bio-Based Products	VU	4.5	3.5		Bioresource Process Technologies	VU	5	4
	Fundamentals of Electrical Power Systems for Biorefineries	VO	2	3		Fundamentals of Electrical Power Systems GPE	VO	2	3
	Physik des Papiers und Prüfverfahren	VO	2	2		Paper Structure and Properties	VO	2	1.5
	Stoffaufbereitung und chemische Additive	VO	5	3.5		Stock Preparation and Chemical Additives	VO	5	3.5
	Paper- und Kartonherstellung	VO	5	3.5		Paper and Board Production	VO	5	3.5

Expiring curriculum Chemical and Process Engineering in the version of 2022					Curriculum Chemical and Process Engineering in the version of 2025				
	Course	Course type	ECTS	SSt		Course	Course type	ECTS	SSt
	Labor Papier- und Streichtechnologie	LU	2	2		Paper and Coating Technology Laboratory	LU	2	2
	Prozessintegration und industrielle Digital-isierung	VU	2	2		Process Integration and Industrial Digitisation	VU	2	2
	Spezialprodukte auf Zellstoffbasis	VO	3	2		Sustainable Lignocellulosic Packaging Materials	SE	3	2
	Papiertechnisches Praktikum Papierfabrik	EX	2	2		Excursion Pulp and Paper	EX	2	2
	Papierverarbeitung	VO	2	1.5		Converting and Finishing	VO	2	1.5
	Papier- und Kartonherstellung VA	VO	3	2		Pulp and Paper Technology - Selected Topics	SE	2	2
	Nachhaltige faserbasierte Baustoffe	SE	2	2		Sustainable Fibre Based Packaging Products	SE	3	2
	Visual Basic VT	VU	3	2		Visual Basic CE	VU	3	2
	Nanocellulose Processes and Products	VO	1.5	1		Nanocellulose Processes and Products	VO	2	1.5
	Luftreinhaltung / Abluftreinigung	VU	4	3		Off-Gas Purification Processes	VU	4	3
	Chemisch- Thermische Abwasserreinigung	VU	4	3		Wastewater Treatment	VU	4	3
	Unternehmensführung und Organisation	VO	3	2		General Management and Organisation	VO	3	2
	Industry Excursion Biorefinery	EX	1	1		Industry Excursion Green Process Engineering	EX	1	1
	Labor Umwelttechnik	LU	2	2		Environmental Technologies Laboratory	LU	2	2
	Crop Bioresources - Characterisation and Properties	VO	3	2		Bioresources	SE	4	4
	Lignocellulose Bioresources - Characterisa-tion and Properties	VO	3	2					

Expiring curriculum Chemical and Process Engineering in the version of 2022					Curriculum Chemical and Process Engineering in the version of 2025				
	Course	Course type	ECTS	SSt		Course	Course type	ECTS	SSt
	LCA of Bioresource Value Chains	VO	3	2		Life Cycle Assessment GPE	VU	4	3
	LCA of Bioresource Value Chains	UE	1	1					