

MSc Chemical Engineering - TU Delft

Master's Courses for Exchange Students

The course package proposals presented here were composed considering the coherence of their contents. Although an overlap between lectures and exams of the courses within the same package is not likely, it may occur due to unforeseen circumstances leading to schedule modifications. The course package proposals are intended for MSc students and students who are in the process of finalising their BSc programme.

Please read the courses' prerequisite in order to determine whether the courses you select are a good fit for your educational background.

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Fall semester 2024

Q1 Core Chemical Engineering Courses						
Identifier	Course Name	Credits	Period			
			1	2	3	4
CH3044A	Process Dynamics & Control (PD&C) <i>Required prior knowledge → Basic knowledge of industrial process equipment for heat transfer, separation and chemical reaction. Knowledge of calculus, linear algebra, complex numbers, numerical techniques like integration and their implementation in Python.</i>	4 EC				
CH3153	Molecular Transport Phenomena <i>Required prior knowledge → BSc: Transport Phenomena (4052FYSTRY), Physical Chemistry (4052FYSCY), Thermodynamics (4051CHTHEY and 4052STATHY), Calculus I and II (4051CALC1Y and 4051CALC2Y), Statistical methods (4052STAMEY), Differential Equations (4052LADIFY).</i>	4 EC				
TPM330	Ethics & Risks <i>Required prior knowledge → No prerequisites.</i>	4 EC				

Q2 Advanced Chemical Engineering Courses						
Identifier	Course Name	Credits	Period			
			1	2	3	4
CH3051	Applied Transport Phenomena (ATP) <i>Required prior knowledge → Basic knowledge of ANM (Applied Numerical Mathematics).</i>	4 EC				
CH3682A	Reactors and Kinetics (R&K) <i>Required prior knowledge → Chemical Reactors.</i>	4 EC				
CH3143	Advanced Thermodynamics <i>Required prior knowledge → Physical Chemistry, Thermodynamics, Calculus and Numerical Analysis at bachelor level of chemical engineering. Notions of statistical thermodynamics (origin and meaning of entropy at microscopic level) and very basic notions of quantum mechanics.</i>	4 EC				
CH3013	Interfaces and Particles <i>Required prior knowledge → Basic knowledge on physical-chemistry.</i>	4 EC				
CH3175	Solid State Materials <i>Required prior knowledge → Basic knowledge of quantum mechanics and of physical chemistry.</i>	4 EC				
CH3373	Soft Materials Engineering <i>Required prior knowledge → Basic knowledge on physical-chemistry.</i>	4 EC				

Offered throughout Q1 & Q2 (3 EC per quarter)						
Identifier	Course Name	Credits	Period			
			1	2	3	4
CH3133	Computational Practicum <i>Required prior knowledge →</i> - Bachelor level linear algebra: vector, matrix, linear mapping, basis vectors, solving linear systems, computing eigenvalues and eigenvectors, application of linear algebra - Bachelor level calculus: differentiation and integration of a function in one and more variables, complex numbers, analytical methods for ordinary and partial differential equations, Fourier transformation, applications of calculus - Bachelor level computer programming: elementary instructions, conditional statements and loops, functions and main program	6 EC				

Optional, to be organized throughout Q1 & Q2 (15 EC in total)						
Identifier	Course Name	Credits	Period			
			1	2	3	4
CH3991	Research Project*	15 EC				

Spring semester 2025

Circularity Profile						
Identifier	Course Name	Credits	Period			
			1	2	3	4
CH3085	Chemical Process Technology: Present and Future	4 EC				
CH3543	Inorganic Materials for Energy and Circularity	3 EC				
CH3921	Sustainable Polymer Materials	3 EC				
CH3102	Catalysis for Energy and Circularity	3 EC				

Energy Profile						
Identifier	Course Name	Credits	Period			
			1	2	3	4
CH3513	Electrochemistry for renewable energy	4 EC				
CH3622	Process Intensification	3 EC				
CH3502	Materials for the Energy Transition	4 EC				

Health Profile						
Identifier	Course Name	Credits	Period			
			1	2	3	4
CH3564	Particle Technology for Health and Energy	3 EC				
CH3382	Molecular engineering of soft materials in health care	4 EC				
CH3412	Biological Transport Phenomena	4 EC				

Nuclear Profile						
Identifier	Course Name	Credits	Period			
			1	2	3	4
CH3764	Nuclear medicine	4 EC				
CH3771	Nuclear chemistry	6 EC				
CH3783	Materials chemistry for the nuclear fuel cycle	3 EC				
CH3765	Advanced Materials Characterisation	3 EC				

Other (Specialisation or General)						
Identifier	Course Name	Credits	Period			
			1	2	3	4
CH3073	Separation Processes, Design and Operation	3 EC				
CH3061	Multiphase Reactor Engineering	4 EC				
CH3673	Computational Approaches for Chemistry and Materials	4 EC				
CH3421	Computational Transport Phenomena	6 EC				
CH3112	Artificial Intelligence in (Bio)-Chemical Engineering	3 EC				
CH3065	Multiphase Reactor Engineering II – Design Project	2 EC				

Optional, to be organized throughout Q3 & Q4 (15 EC in total)						
Identifier	Course Name	Credits	Period			
			1	2	3	4
CH3991	Research Project*	15 EC				

* A **Research Project** (of min. 15 EC) at one of our groups within the Faculty of Applied Sciences.

It is possible to combine the research project with courses. The larger the project, the more chance to be accepted by the department. The course code of the Research project is CH3991. Please do notice that an early termination of a TU Delft housing rental contract is not possible.

The MSc Chemical Engineering study guide can be found [here](#). Please note that the course offerings and time schedules are subject to modification.

We do not recommend mixing courses from different programmes and/or faculties since this is likely to lead to scheduling conflicts and overlap. Such scheduling conflicts are the responsibility of the student.

Students who intend to do a research project are strongly encouraged to take a proactive role in finding a supervisor and a research project within the Chemical Engineering department. The first step is to find a scientific contact person within the Faculty of Applied Sciences (possibly someone you have already been in contact with or are planning to collaborate with) and get direct approval from the professor of the group where you wish to do your research. In most cases, you will work under the supervision of a PhD student and his/her professor. Before applying for one of our two annual exchange periods, you should have already arranged a project yourself or be in the process of doing so. Please mention in your application the relevant actions you have taken.

In special cases, we may assist you in finding a supervisor for the research project after the application deadline but as mentioned, we expect you to take the lead. You can choose from the seven research groups of the Chemical Engineering department and the Radiation Science & Technology department (Reactor Institute Delft).

For more information about the departments of the Faculty of Applied Sciences, see:

[Departments at the Faculty of Applied Sciences](#)
[The Department of Chemical Engineering](#)
[Radiation Science & Technology](#)

You may also contact the IRS department (Burak Eral or Andrzej Stankiewicz) of the 3ME Faculty. Their contact information can be found on [this website](#).

When contacting our academic staff for the first time, please include the following information in your email:

- Why you have chosen TU Delft and the respective department
- That you are an exchange student from a TU Delft partner university, registered through the International Office Applied Sciences.
- The research area/topic you are interested in and why
- A resume covering your experiences and personal details
- A transcript of records

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