

## 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' prerequisites in order to determine whether the courses you select are a good fit for your educational background.

**Scroll down for Spring Semester**

### Fall semester 2024

Q1 Core Chemical Engineering Courses						
Identifier	Course Name	Credits	Period			
			1	2	3	4
<a href="#">CH3044A</a>	<b>Process Dynamics &amp; Control (PD&amp;C)</b> <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				
<a href="#">CH3153</a>	<b>Molecular Transport Phenomena</b> <i>Required prior knowledge → BSc: Transport Phenomena (4052FYSTRY), Physical Chemistry (4052FYSCKY), Thermodynamics (4051CHTHEY and 4052STATHY), Calculus I and II (4051CALC1Y and 4051CALC2Y), Statistical methods (4052STAMEY), Differential Equations (4052LADIFY).</i>	4 EC				
<a href="#">TPM330</a>	<b>Ethics &amp; Risks</b> <i>Required prior knowledge → No prerequisites.</i>	4 EC				

Q2 Advanced Chemical Engineering Courses						
Identifier	Course Name	Credits	Period			
			1	2	3	4
<a href="#">CH3051</a>	<b>Applied Transport Phenomena (ATP)</b> <i>Required prior knowledge → Basic knowledge of ANM (Applied Numerical Mathematics).</i>	4 EC				
<a href="#">CH3682A</a>	<b>Reactors and Kinetics (R&amp;K)</b> <i>Required prior knowledge → Chemical Reactors.</i>	4 EC				
<a href="#">CH3143</a>	<b>Advanced Thermodynamics</b> <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				
<a href="#">CH3013</a>	<b>Interfaces and Particles</b> <i>Required prior knowledge → Basic knowledge on physical-chemistry.</i>	4 EC				
<a href="#">CH3175</a>	<b>Solid State Materials</b> <i>Required prior knowledge → Basic knowledge of quantum mechanics and of physical chemistry.</i>	4 EC				
<a href="#">CH3373</a>	<b>Soft Materials Engineering</b> <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
<a href="#">CH3133</a>	<b>Computational Practicum</b> <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
<a href="#">CH3991</a>	Research Project*	15 EC				

## Spring semester 2025

Circularity Profile						
Identifier	Course Name	Credits	Period			
			1	2	3	4
<a href="#">CH3085</a>	Chemical Process Technology: Present and Future	4 EC				
<a href="#">CH3543</a>	Inorganic Materials for Energy and Circularity	3 EC				
<a href="#">CH3921</a>	Sustainable Polymer Materials	3 EC				
<a href="#">CH3102</a>	Catalysis for Energy and Circularity	3 EC				

Energy Profile						
Identifier	Course Name	Credits	Period			
			1	2	3	4
<a href="#">CH3513</a>	Electrochemistry for renewable energy	4 EC				
<a href="#">CH3622</a>	Process Intensification	3 EC				
<a href="#">CH3502</a>	Materials for the Energy Transition	4 EC				

Health Profile						
Identifier	Course Name	Credits	Period			
			1	2	3	4
<a href="#">CH3564</a>	Particle Technology for Health and Energy	3 EC				
<a href="#">CH3382</a>	Molecular engineering of soft materials in health care	4 EC				
<a href="#">CH3412</a>	Biological Transport Phenomena	4 EC				

Nuclear Profile						
Identifier	Course Name	Credits	Period			
			1	2	3	4
<a href="#">CH3764</a>	Nuclear medicine	4 EC				
<a href="#">CH3771</a>	Nuclear chemistry	6 EC				
<a href="#">CH3783</a>	Materials chemistry for the nuclear fuel cycle	3 EC				
<a href="#">CH3765</a>	Advanced Materials Characterisation	3 EC				

Other (Specialisation or General)						
Identifier	Course Name	Credits	Period			
			1	2	3	4
<a href="#">CH3073</a>	Separation Processes, Design and Operation	3 EC				
<a href="#">CH3061</a>	Multiphase Reactor Engineering	4 EC				
<a href="#">CH3673</a>	Computational Approaches for Chemistry and Materials	4 EC				
<a href="#">CH3421</a>	Computational Transport Phenomena	6 EC				
<a href="#">CH3112</a>	Artificial Intelligence in (Bio)-Chemical Engineering	3 EC				
<a href="#">CH3065</a>	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
<a href="#">CH3991</a>	Research Project*	15 EC				

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

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.

### **CH3843 Design Project and CH3803 Product, Process and Design**

Course CH3843 Design Project and CH3803 Product, Process and Design are only offered to students who finished all Q1 and Q2 courses. So unless you studied as an exchange student in semester 1 (Fall) at TU Delft, and finalised all Q1 Core Chemical Engineering Courses and 3 of the offered Q2 Advanced Chemical Engineering Courses you can participate in CH3843 and CH3803. If you are an exchange student for semester 2 (Spring) only, you cannot participate.

### **Research Project**

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.

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](#)

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

*Last update October 2024*