



# Course offer Chemistry Exchange

Academic year 2024-2025

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## CHEMISTRY

Chemistry is all about experimenting, researching and analysing. You are going to ensure diseases are no longer life-threatening, or you'll be solving murder cases based on DNA analyses.

You will be researching the composition of substances and products and will be able to analyse these down to the very last molecule. You also will develop new bio based materials or innovative methods based on rules of green chemistry based From waste water to medicine to plastics. The future is shaped by chemistry!

### COURSE OFFER 2024-2025

#### Fall Semester

Based on your educational background the programme coordinator will determine whether you will be admitted to the 1<sup>st</sup>, 2<sup>nd</sup> or 3<sup>rd</sup> year. Each topic (1 block per Q) contains a total of 15 ECT's.

You may choose courses from the second year topics. Topics in the fall semester (Q1 and Q2) of the **1<sup>st</sup> year** are

- Food Chemistry (Q1)
- Quality control (Q2)

You may choose courses from the second year topics. Topics in the fall semester (Q1 and Q2) of the **2<sup>nd</sup> year** are

- Environmental Chemistry & Toxicology (Q1)
- Bio-organic toolbox. (Q2)

You can follow **3<sup>rd</sup> year** courses either from the Applied Chemistry or Life Sciences specialisation. Topics of the fall semester (Q1 and Q2) are

Applied Chemistry:

- Specialisation Applied Chemistry I (Q1)
- Specialisation Applied Chemistry II (Q2)

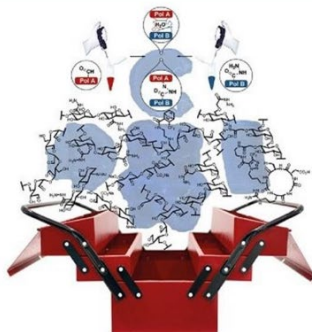
Life Science:

- From Molecules & Cells to Human Health (Q1)
- Achievements & Challenges of Life Sciences (Q2)

The full description of the courses can be found at the following link: <https://hz.nl/en/about-hz/rules-and-regulations> under "Regulations study programmes".

**Theme characteristics**

- One quarter, one theme of 15 European Credits (EC's).
- Cooperative learning.
- Orientation on profession.
- Focus on important techniques in Organic Synthesis.
- Focus on important techniques in biochemical analysis.



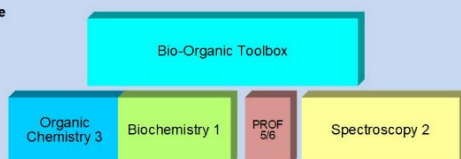
**Organic synthesis and analysis**

- Organic synthesis
- Purification
- Determining yield
- Chemical structure determination
- Organometals
- Carbonyl chemistry

**Properties of biological macromolecules.**

- Structure of carbohydrates
- Isolation and characterization of starch
- Structure of proteins
- Purification and yield determination of caseine
- Enzyme activity assay

**Theme structure**



**Legend**

General

Applied Chemistry

Life Sciences

Professionalisation

Visual example, Bio Organic Toolbox fall semester 2<sup>nd</sup> year

Visual example, Environmental Chemistry & Toxicology fall semester 2<sup>nd</sup> year

**Spring semester**

In our spring semester you can follow courses from our 1<sup>st</sup> or 2<sup>nd</sup> year. Topics of the spring semester (Q3 and Q4) of the program of the 1<sup>st</sup> year are:

- Biobased Products & Technology (Q3)
- Health & Chemistry (Q4)

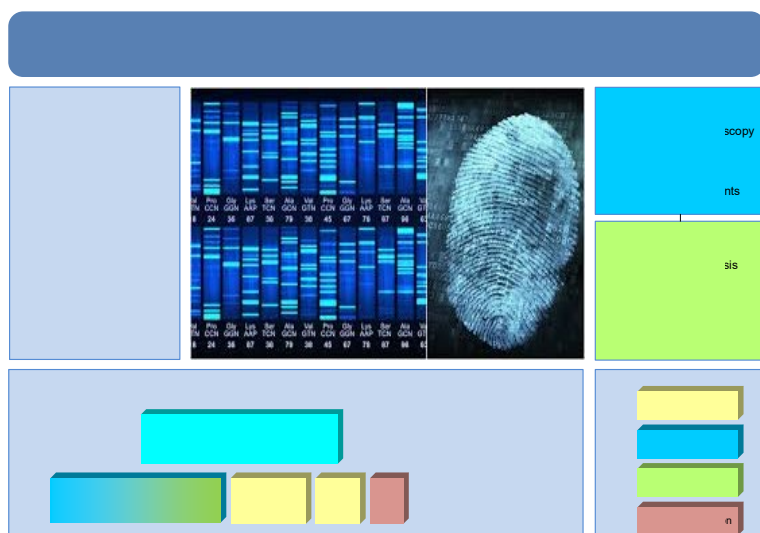
Topics of the spring semester (Q3 and Q4) of the program of the 2<sup>nd</sup> year are:

- Forensic Science (Q3)
- Marine Bio based Specialties (Q4)

The full description of the courses can be found at the following link: <https://hz.nl/en/about-hz/rules-and-regulations> under "Regulations study programmes".

### Quarter 7 (Q3) Forensic Science

In this quarter different chemical, biochemical and also biological techniques will be topic of the program. Both theoretical lessons and practicals as well will travel through the interesting world of forensic research to learn you how to solve crimes at the lab.



Visual example, Forensic Science, Spring semester 2nd year.

### Quarter 8 (Q4), Marine Bio based Chemistry

The chemistry program does have a very close cooperation with the research group of Marine Bio based Chemistry. This research group focusses on scientific research on marine organism and their chemical and biological content. Based on this research application of the results is part of the research program. As a student you will get involved in the current research projects of marine bio based topics. This will learn you how we can face challenging problems and how to contribute to a demanding search for solutions to create a more bio based economy.

**Based on your educational background the programme coordinator will determine whether you will be admitted to the 1<sup>st</sup>, 2<sup>nd</sup> or 3<sup>rd</sup> year.**

**Additional you can choose the course below which is especially for exchange students.**

- Dutch Culture & Language 2 ECTS

#### **Project: Marine Bio based Chemistry**

3<sup>rd</sup> and 4<sup>th</sup> years students may also work on research topics related to the Bio based economy. This research can be done in the 1<sup>st</sup> semester and the 2<sup>nd</sup> semester as well. The research group Marine Bio based Chemistry is working on analysis of bio-active molecules in marine organism. Final goals of this research is develop useful applications and products. Fundamental research is combined with scientific knowledge of physiology and ecology of marine organism. You will develop on skills and knowledge of chemical isolation, analysis and applications of chemical marine components. Examples of topics of research are signaling components, natural UV- resistant molecules and also taste- and texture related molecules in algae and seaweed.