Bachelor’s degree in Chemistry

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Study programme in Chemistry – the study programme with the most solutions – in theory and in practice.
Chemistry

Creative processes
Chemistry is concerned with the conversion of all kinds of raw materials into substances with new chemical, physical and biological properties for many new exciting applications. As a chemist you are at the centre of this creative process and can contribute to designing the future. You develop new products, analysis methods and production processes, tap new raw materials or secure our energy supply. While responsible handling of resources and the environment is vital for these activities, enthusiasm for connecting theory and practice is also essential for chemistry students at a university of applied sciences.

Study programme
Are you interested in scientific relationships? Do you enjoy experimenting? Do you want to get to grips with new problems and challenges in chemistry and biological chemistry? Then the degree programme in Chemistry is just the thing for you!

It provides broad technical knowledge in the natural sciences. Using mathematical, physical, chemical and biological models, the first step is to investigate how chemical processes work, and then to develop promising new substances and processes in the laboratory on the basis of what you have learnt. Later in the programme, you choose whether to specialise in Chemistry or Biological Chemistry. These majors prepare you for the specific demands of your future professional career.

Our Bachelor's degree programme in chemistry in Wädenswil has been awarded the ‘Chemistry Eurobachelor®’ quality label.

Structure
The programme spans six semesters of full-time study. The first two semesters, in which you obtain a solid foundation in general chemistry, biology, mathematics and physics, are identical for both specializations.

In the third semester you select the topics that best correspond to your prior knowledge, interests and career goals by choosing to specialize in either Chemistry or Biological Chemistry. You conclude your studies with a Bachelor’s thesis. Project-oriented work, often in collaboration with industry, is a central part of this.

During the entire study programme, you are trained to enhance your communication skills, as well as your ability to work independently and as part of a team. Furthermore, the modular structure enables you to spend a semester studying abroad and take part in student exchanges with other universities.

The study programme can also be completed on a part-time basis.
## Overview

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Specializations: Chemistry (CH), Biological chemistry (BC)

Graduates are awarded the protected and internationally recognized title ‘Bachelor of Science ZFH in Chemistry’. The study programme comprises 180 credits (ECTS). Detailed information on the study programme is available at www.zhaw.ch/en/lsfm/study.
Chemistry student

I like being on the move and the degree programme in chemistry gives me the dynamic atmosphere I need. It’s a journey with a variety of different options, which never gets boring.

Romina
Follow your own interests by selecting chemistry or biological chemistry as the focus of your studies.
in the study programme

Chemistry

The classic discipline of chemistry has lost none of its fascination and is now more in demand than ever: areas of application range from pharmaceutical and cosmetic active ingredients, plastics and renewable raw materials to the energy sources and fuels of the future.

Areas of focus
- Industrial chemistry
- Organic chemistry
- Physical chemistry
- Chemical engineering

Areas of activity
- Development of syntheses, processes and materials
- Development of methods and implementation of analyses
- Set-up and application of measurement and sensor technology
- Project, operation and production management
- Design and implementation of process and environmental technology
- Process control, quality assurance and quality management
- Operational safety, risk analysis and risk management
- Technical purchasing and sales
- Consulting and training for employees and customers

Biological Chemistry

The young discipline of biological chemistry uses an interdisciplinary approach to enhance understanding of the mysteries of life and to enable this understanding to be turned to practical use. It involves investigation of the chemical processes in living organisms. This requires additional theoretical and practical knowledge of biochemistry, micro and cell biology, biochemical engineering and molecular genetics. Career opportunities can especially be found in the life sciences industry, where the detection of correlations at the interface of chemistry and biology has a high priority.

Areas of focus
- Biochemistry
- Microbiology
- Cell biology
- Bioengineering

Areas of activity
- Development of pharmaceuticals, processes and materials
- Development of methods and implementation of bioanalyses
- Development and production of cell and tissue material
- Production of chemicals using biological methods
- Project, operation and production management
- Process control, quality assurance and quality management
- Operational safety, risk analysis and risk management
- Technical purchasing and sales
- Consulting and training for employees and customers
Prospects

Educational objectives

The Bachelor of Science in Chemistry degree programme provides a broad education in chemistry, biology and chemical engineering, with mathematics and physics as foundations, which enables you to react flexibly to a rapidly changing professional environment.

The two specialisations allow you to focus on a particular area without losing sight of the overall goal of acquiring a thorough education in general chemistry.

The inclusion of biological chemistry in the study programme extends the variety of career paths available to you on graduation. You practise implementing the concepts acquired in lectures through tasks in the laboratory in step with actual practice. In addition, you learn to study independently to cope with new areas of work through the individual self-study component (around 50 percent of the degree programme). In the final year, your knowledge and skills are deepened through participation in applied research and development projects.

Career prospects

Chemistry graduates from a university of applied sciences are particularly sought after by private and public enterprises and government departments because of the practical orientation of the degree programme. In large companies, they tend to work in specialized fields, while in small and medium-sized enterprises they often assume broad responsibilities in technological positions, leadership and management.

Industry and manufacturing
- Fine and speciality chemicals
- Agricultural, construction and cleaning chemicals
- Plastics, textile, paint and coating chemicals
- Manufacturers of cosmetics, fragrances and flavours
- Food chemistry
- Pharmaceutical industry
- Biotechnology
- Nanotechnology

Research and development
- Universities and research institutes
- Chemical or related industries
- Manufacturers of analytical instruments and chemical and biotechnological equipment

Consulting, cantonal and federal agencies
- Analytical laboratories
- Energy, environmental and engineering offices
- Hospitals
- Public administration

Master’s degree programme / Continuing education

After successfully completing your Bachelor’s degree at the ZHAW in Wädenswil, you can opt for the research-based and practically-oriented Master of Science in Life Sciences degree with the specialisation “Chemistry for the Life Sciences”. A Master’s degree enhances your career opportunities, particularly in international companies.

www.zhaw.ch/lsfm/master-lifesciences/en

You can also attend practice-related continuing education courses or study programmes (MAS, DAS, CAS) at a university of applied sciences or traditional university. Participation in conferences, for example those taking place at the Institute of Chemistry and Biological Chemistry, equips you with new knowledge and fosters professional networking.

Full information in German:
www.zhaw.ch/lsfm/weiterbildung
After studying chemistry in Wädenswil you are ideally equipped and sought after for positions of responsibility.
I work hard every day to achieve my goals. Getting a degree in chemistry and taking part in the 2016 Olympic Summer Games are both exciting challenges that inspire me to give everything I’ve got.
Important information

Conditions for acceptance

The study programme is multidisciplinary and taught in German*. Students come from a broad variety of educational backgrounds.

- Candidates with a vocational baccalaureate (Berufsmaturität) and related vocational training can begin their studies directly:
  - Laboratory technician with a state-recognised qualification (EFZ) in one of the following fields:
    - chemistry
    - biology
    - paints and coatings
    - physics
    - textiles
  - Chemical and pharma technologist with a state-recognised qualification (EFZ)
- Candidates with the qualification Biomedical Analyst HF can also begin their studies directly.
- Candidates with a vocational baccalaureate (Berufsmaturität) and an apprenticeship in an unrelated profession are required to have work experience in a profession related to their field of study. General work experience is recognised so that, depending on the profession learned, a further six to twelve months of professional experience will need to be completed.
- Candidates with an academic baccalaureate or professional baccalaureate (Fachmaturität) must have 12 months’ work experience in a relevant field.

The recognition of work experience or internships completed is granted by the programme director "sur dossier".

For information on additional admission options and for special cases (e.g. foreign qualifications), please contact the programme director.

Support from the ZHAW

If you do not have the relevant work experience, you can take a laboratory introduction course here at the ZHAW. This prepares you for the internship in industry which you need for admission to the Chemistry degree programme. The ZHAW laboratory introduction course lasts three months and provides training in the important skills and work techniques which are required in a laboratory. It begins mid-August.

Other ways of preparing for the Bachelor’s degree programme, such as preparatory courses, e-learning for mathematics, literature etc. can be found at www.zhaw.ch/lsfm/vorkurse

International exchange

Would you like to do part of your studies abroad? The ZHAW provides this valuable opportunity. An exchange semester, a foreign internship, attendance at a summer school, a field trip or a language course all bring many advantages: you get to know a different culture and language as well as another educational and research system, and gain experience for your professional life. Chemistry students can participate in a bilateral exchange programme, for example with the Worcester Polytechnic Institute (WPI) in the USA. Moreover, students at the School of Life Sciences and Facility Management have the opportunity to take part in an exchange semester at partner universities through the Swiss European Mobility Programme (SEMP). Our specialist academic counsellors and the staff of the International Relations Office at the ZHAW (IRO) will be pleased to provide individual consultation without obligation. For more information on international student online registration for an exchange semester, and reports of students’ experiences, see www.zhaw.ch/lsfm/international/en

Dates

The study programme begins mid-September. The registration deadline is 30 April.

* German at C1 level (Cambridge Advanced or equivalent) is required.
Study and research in Wädenswil: practically-oriented, creative, passionate and reflective

The ZHAW is one of the leading Swiss universities of applied sciences. The School of Life Sciences and Facility Management currently has around 1500 students and over 600 employees. Its study and continuing education options include five Bachelor’s and three Master’s degree programmes as well as a broad selection of continuing education courses.

Our expertise in life sciences and facility management in the areas of the environment, food and health enables us to make a vital contribution to solving social challenges and improving quality of life. Our success is based on five dynamic institutes with extensive competence in research, development and services in the disciplines of chemistry and biotechnology, food and beverage innovation, natural resource sciences, applied simulation, and facility management.

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