



Life Sciences and
Facility Management

Master's degree in Life Sciences

Specialisation in Chemistry for the Life Sciences

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“Focus on research: your Master’s thesis and the scientific enquiry it involves are at the heart of your studies.”

The Master’s degree in Life Sciences at a glance

Aim	In the research-based Master's degree programme, you select particular areas to explore, deepen your understanding of your subject and expand your scientific skills. Your application-focused Master's thesis represents the scientific core of the study programme.
Specialisation	You specialise and graduate in one of four fields: Food and Beverage Innovation, Pharmaceutical Biotechnology, Chemistry for the Life Sciences, Applied Computational Life Sciences.
Title	Master of Science (MSc) ZHAW in Life Sciences with specialisation in Chemistry for the Life Sciences.
Study agreement	Before your studies begin, an individual study agreement (ISV) is worked out with your supervisor. It includes your personal goals and the subject area of your Master's thesis, and is designed to match your interests, educational background and objectives. More on page 9
Cooperation	Students benefit from networking with the four Swiss Universities of Applied Sciences ZHAW, BFH, FHNW and HES-SO. A third of the lessons are taught as part of combined courses run jointly by these different universities. More on page 9
Learning concept	Research-based learning with a strong focus on the Master's thesis; combination of independent learning, contact lessons and e-learning.
Duration and workload	3 semesters of full-time study, with part-time also possible: 90 credits (ECTS).
Teaching location and language	Teaching takes place in Wädenswil, Olten or Berne. Block weeks can also be held directly at partner universities. The language of instruction is English or German, depending on the module. More on page 9
Study fees	Semester fee CHF 720; for students whose place of residence is not Switzerland when starting the programme, an additional CHF 500 is charged. See the detailed study cost overview at: www.zhaw.ch/lspm/master/en .
Entry requirements	One of the following prior qualifications is required: Bachelor's degree from a university of applied sciences with an above average performance (ECTS grade A or B or a mark of at least 5.0). FH diploma (forerunner of the Bachelor's degree) with an above average performance (average mark of 5.0 or higher). Recognition of at least 2 years of professional experience and/or of postgraduate studies in a corresponding professional area in agreement with the programme directors. University/ETH Bachelor's degree: practice-oriented «passerelle»: 6 months' work experience in the area of your specialisation. Admission «sur dossier» possible with professional experience and prior education in a natural science field.
Start of studies	Every February and September; registration deadline 31 October and 30 April.
Master's Thesis	The Master's thesis is based on applied research throughout your studies. You answer questions from practice, often in cooperation with national or international partners. More on page 7
More information	Registrar's office +41 58 934 59 61, www.zhaw.ch/lspm/master/en . Info events take place every spring and autumn.

Chemistry for the Life Sciences

Symbiosis of chemistry, biochemistry and nanotechnology

In the specialisation Chemistry for the Life Sciences, you acquire practically-oriented knowledge of the interfaces between disciplines and you learn to skilfully combine specialist competences from chemistry, biochemistry, analytics as well as materials and nanotechnology. In your research and development activities you carry out targeted interdisciplinary work on socially relevant issues and develop solutions of high practical significance.

Educational objectives

This specialisation is designed for Bachelor's graduates from the fields of chemistry, biological chemistry, biotechnology, materials science and related disciplines. You develop your expertise on the basis of your sound knowledge of chemistry and biological chemistry. With a Master's degree in Chemistry for the Life Sciences you will be a highly sought-after specialist with a profile that is specifically tailored to the requirements of the chemical and pharmaceutical industries.

Video

In the video, you gain insight into the everyday reality of your studies and the world of work you will encounter on graduating. Speakers in the video include faculty members, graduates and employers. Get a realistic impression of the Master's programme at www.zhaw.ch/icbt/master-chemistry.



Competences

You expand your knowledge about the representation of small and large active molecules, and learn how to interpret the structure-activity relationships you discover using the latest analytical methods. The interaction between animate and inanimate matter is the focus of the nanotechnological approach used. Through targeted structuring and functionalisation of surfaces, you develop biomaterials for use in regenerative medicine, diagnostics and drug delivery. A further forward-looking area of competence is «Green Chemistry», i.e. the design and implementation of sustainable chemical processes which take environmental and economic aspects into account.

In addition to broadening your technical and methodological expertise, you also expand your personal skills. Focusing on the Master's thesis, which involves application-oriented research, furthers your ability to solve problems, see things from different perspectives, and link entrepreneurial and scientific ways of thinking. You are a member of a research group from the very beginning of your study programme. This ensures valuable and extensive scientific interaction with colleagues, and enhances your ability to work in a team. Modern teaching methods promote self-discipline, language proficiency and intercultural exchange.

Social challenges

There are currently five socially relevant areas of challenge where you can make a valuable contribution as a life science chemist:

1. **Medicine:** chemical and pharmaceutical research and development to meet the challenges of an aging population and rising health costs
2. **Nutrition:** (bio)chemically-oriented research and development against the background of population growth and the problematic food security situation in many countries
3. **Ecology and environmental technology:** (bio)chemical research and development dealing with environmental issues from economic and technological perspectives – in the context of an increasing population, related food production challenges, and the burden they place on soil, air and water
4. **Energy:** applied research into the focal issues addressed by public debate on the future role of renewable raw materials as an efficient energy source and an alternative energy form
5. **Green Chemistry:** research into and development of new clean chemical and biochemical processes which are based on renewable resources

Prospects

After graduation your broad but specialised knowledge will give you excellent chances of obtaining a leadership position. Areas of application include the traditional sectors represented by the chemical and pharmaceutical industry, the food industry and biotechnology companies. They also include fields of activity relating to the five social challenges described above: for example, energy research, product development, production and quality assurance in the areas of regenerative medicine, speciality chemicals, the production of vaccines, drugs and functional materials, diagnostics, sensor engineering, and nanotechnology. All of these are growth areas in Switzerland and worldwide.

Graduate portraits

Master's graduates who specialised in Chemistry for the Life Sciences – where are they now? At www.zhaw.ch/icbt/master-chemistry you can find out what positions they now occupy, what they particularly appreciated about the Master's programme, and what tips they have for prospective Master's students.

Fields of activity and research

Current fields of research and activity include the development of advanced analytical technologies for medical diagnostics and forensics, environmental analysis, biomaterials, biocompatible materials and surfaces, new materials for photovoltaic applications, tissue engineering, drug delivery, peptides and bioconjugates, bioanalytics, protein chemistry, process analytical technology (PAT), and process design in chemistry with an emphasis on ecological and economic concerns («Green Chemistry»).



“As a life sciences chemist you respond to major social challenges, for example in the field of regenerative medicine.”

Master's Thesis

Focus of the study programme

The Master's thesis is at the heart of your studies. You select modules from the cooperation at an early stage to prepare you for work on your thesis. From the start you are part of a research group at the Institute of Chemistry and Biological Chemistry in Wädenswil or in an external company, organisation or research institute. On the basis of your research you answer specific questions and work out solutions which are relevant for research, business and/or society, often in cooperation with national or international partners. The thesis gives you the opportunity to demonstrate that you can apply the knowledge and competences you have acquired.

Areas of research

You choose the topic of your Master's Thesis in one of the following areas listed below. You deepen your experimental abilities in your selected area of research and gain detailed insight into the methodologies needed to carrying out demanding research projects in:

- Analytical and Physical Chemistry
- Biochemistry
- Chemical and Biochemical Engineering
- Functional Materials and Nanotechnology
- Industrial Chemistry
- Micro-, Cell Biology and Tissue Engineering
- Organic Chemistry and Medicinal Chemistry
- Biocatalysis

You can find more information about the groups, centres and contact details at www.zhaw.ch/icbt.

Contact

If you have any questions about the specialisation in Chemistry for the Life Sciences, please contact me:



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Structure of the MSc programme

Four steps to the MSc in Life Sciences

The three semesters of full-time study which lead to your Master of Science in Life Sciences comprise the following three fields of competence plus a Master's thesis, giving a total of 90 credits (**module descriptions at www.zhaw.ch/lsfm/master/en**).

Core Competences – minimum 12 credits

These modules provide you with work-oriented skills. With these Core Competences you acquire knowledge in the following areas: «Management, Business and Society» as well as «Handling and Understanding Data».

Each module lasts half a semester – approx. 2/3 of the lessons are held online and approx. 1/3 consists of decentralised teaching (accompanied exercises, case studies etc.) directly in Wädenswil. You choose at least four from the following eight modules (each 3 ECTS):

Core Competences in Management, Business and Society:

- Business Administration for Life Sciences
- Management and Leadership for Life Sciences
- Innovation and Project Management
- Politics and Society

Core Competences in Handling and Understanding Data:

- Handling and Visualising Data
- Design and Analysis of Experiments
- Modelling and Exploration of Multivariate Data
- Data and Ethics

Cluster-specific modules – minimum 9 credits

Cluster-specific modules (each 3 ECTS) complement the specialisation modules. The specialisation Chemistry for the Life Sciences is part of the cluster Chemistry. You choose at least three from the following six modules out of the cluster Chemistry.

Cluster Chemistry:

- Materials Science
- Surface Characterisation
- Polymers and Applications
- Chemistry and Energy
- Green Chemistry

- Industrial Chemical Process Safety
- In addition to the modules listed above, you can also choose from the following modules from other clusters (each 3 ECTS):
- Modelling of Complex Systems (Cluster Computation)
- Machine Learning and Pattern Recognition (Cluster Computation)
- Optimisation and Bio-Inspired Algorithms (Cluster Computation)
- Imaging for the Life Sciences (Cluster Computation)
- Physiology and Immunotherapies (Cluster Bio/Pharma)
- Tissue Engineering for Drug Discovery (Cluster Bio/Pharma)
- Life Cycle Assessment (Cluster Environment)
- Sustainable Natural Resource Management (Cluster Environment)
- Biodiversity (Cluster Environment)
- Nutrition and Nutrition Related Chronic Diseases (Cluster Food)
- Sustainable Food Supply Chains (Cluster Food)

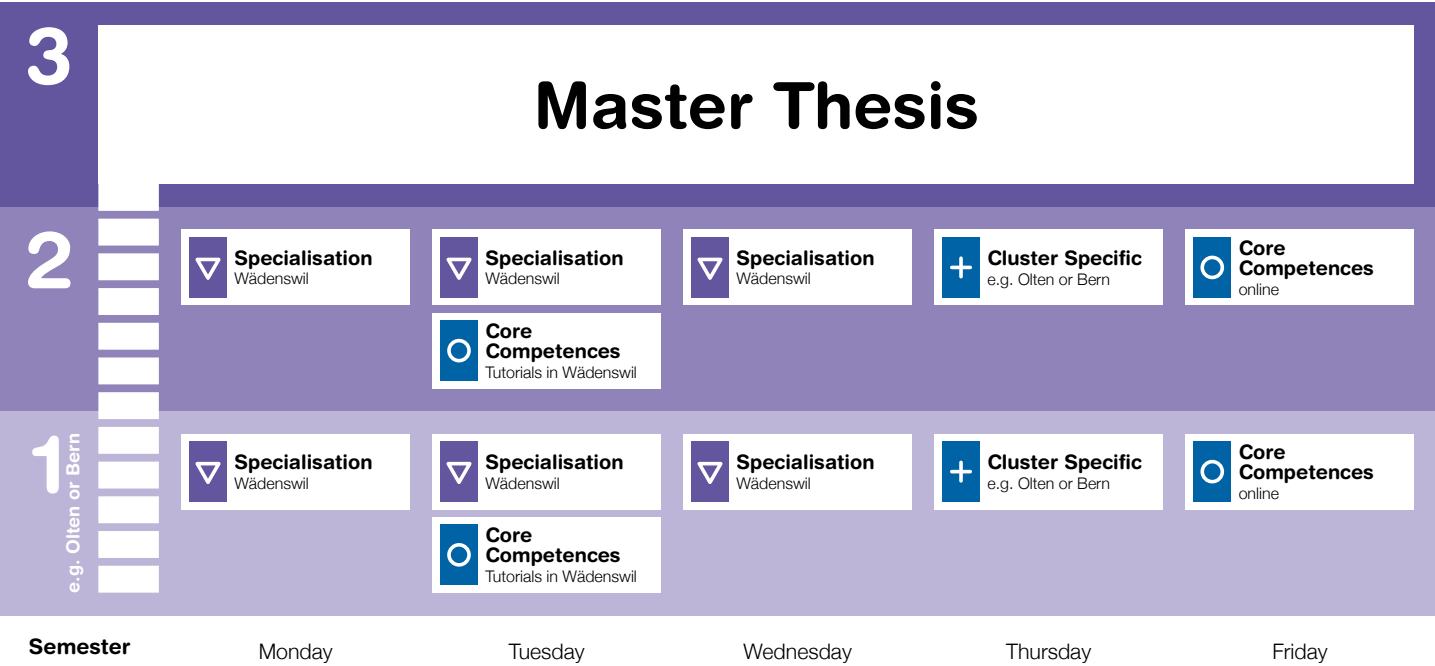
Specialisation Skills – 20 credits

You broaden and specialise your knowledge of chemistry for the life sciences by taking all of the following modules (each 4 ECTS):

- Small Active Molecules
- Big Active Molecules
- Biomaterial and Functional Surfaces
- Analytical Technologies
- Green Chemistry – Advanced Concepts

Master's Thesis – 40 credits

Your Master's thesis is the core of your studies. You select your topic before beginning the MSc programme. You work on the thesis throughout your studies (more on pages 7).



Structure of the programme

The diagram shows the general structure of a full-time Master's programme. You determine the actual sequence and focal points yourself (see the Study Agreement section).

Study Agreement

Before your studies begin, you decide on your personal educational goals, define the topic of your Master's thesis, and select your individual plan of study from the selection of modules with your supervisor. Your personal study programme is based on your educational background, your interests and your objectives. Not only at this stage, but also throughout your studies, you profit from fruitful interaction with your supervisor. A combination of self-study, contact lessons and modern e-learning methods enables you to create a contemporary learning experience which includes a high degree of flexibility.

Cooperation

The Master of Science in Life Sciences is a cooperative venture, conceived and run by the ZHAW together with three other Swiss universities of applied sciences:

- The Berne University of Applied Sciences BFH
- University of Applied Sciences and Arts Northwestern Switzerland FHNW
- University of Applied Sciences and Arts Western Switzerland HES-SO

In the cooperation modules you benefit from the expertise of all four partners, create a broad network, and participate in interdisciplinary exchange. In the Core Competences and cluster-specific modules, classes take place in English (required language level C1).

“

Innovative learning and professional research are in store for you at this inspiring location above the Lake of Zurich.

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About us

The ZHAW

The ZHAW (Zurich University of Applied Sciences) is one of the leading universities of applied sciences in Switzerland. Teaching, research, continuing education, consulting and other services are scientifically-based and practice-oriented. The ZHAW comprises eight schools at three locations (Wädenswil, Winterthur, Zurich). Currently, over 14000 students are enrolled at the ZHAW.

The School of LSFM

The School of Life Sciences and Facility Management (LSFM) is located in Wädenswil on the left shore of the Lake of Zurich. Teaching and research are carried out in the fields of environment, nutrition/food, health and society. The degree and continuing education programmes include Bachelor's degree programmes, Master's degree programmes, and a wide range of continuing education courses. Around 1800 students are currently enrolled at the LSFM in Wädenswil.



Environment | Food | Health | Society
Our competencies in Life Sciences and Facility Management.

Study and continuing education

The Bachelor's degree programme provides practically-oriented knowledge, general education and training in work methodology, and leads to a professional qualification. The consecutive Master's degree programme allows you to specialise within your chosen field and acquire an additional professional qualification. Four Master's degree programmes are offered at the ZHAW campus in Wädenswil: Preneurship for Regenerative Food Systems, Life Sciences, Real Estate & Facility Management and Environment and Natural Resources. Engaging in ongoing education and keeping your skills and know-how up to date are important for ensuring professional success. The ZHAW offers customised, practice-oriented courses, symposiums and continuing education programmes.

Research and development

Working in conjunction with businesses, public agencies and associations, our institutes engage in applied research and provide services for third parties. Close collaboration with external parties ensures the transfer of knowledge and technology between the academic realm and professional practice. Our technical installations and equipment are state-of-the-art. In our modern laboratories and testing and production facilities, applied research and development projects can be conducted to the highest professional and practical standards.

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 1800 students and employs more than 600 people. The educational programme comprises Bachelor's and Master's degree programmes as well as a broad range of further training and 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 dynamic institutes with extensive competence in research, development and services in the disciplines of applied computational life sciences, biotechnology, chemistry, food and beverage innovation, natural resource sciences and real estate & facility management.



Environment | Food | Health | Society
Our competencies in Life Sciences
and Facility Management.

Contact

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Visit us



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