Study guide
Master in Life Sciences
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>3</td>
</tr>
<tr>
<td><strong>The Master's Programme</strong></td>
<td>5</td>
</tr>
<tr>
<td>Qualified experts for the growing life sciences market</td>
<td>5</td>
</tr>
<tr>
<td>Where life sciences come alive</td>
<td>6</td>
</tr>
<tr>
<td>Specialisations</td>
<td>8</td>
</tr>
<tr>
<td><strong>Structure of the study programme</strong></td>
<td>12</td>
</tr>
<tr>
<td>Core competence modules</td>
<td>14</td>
</tr>
<tr>
<td>Module Competences</td>
<td>16</td>
</tr>
<tr>
<td>Study regulations</td>
<td>22</td>
</tr>
<tr>
<td>Compulsory elective modules</td>
<td>23</td>
</tr>
<tr>
<td>The Master’s thesis</td>
<td>24</td>
</tr>
<tr>
<td>Our Partner Schools</td>
<td>25</td>
</tr>
<tr>
<td>Basel – Centre of the global Life Sciences Industry</td>
<td>27</td>
</tr>
<tr>
<td><strong>General information</strong></td>
<td>28</td>
</tr>
<tr>
<td>Admission and enrolment</td>
<td>28</td>
</tr>
<tr>
<td>Fees and grants</td>
<td>30</td>
</tr>
<tr>
<td>FHNW University of Applied Sciences and Arts</td>
<td>31</td>
</tr>
<tr>
<td><strong>Contact and student advisory service</strong></td>
<td>32</td>
</tr>
</tbody>
</table>
The FHNW School of Life Sciences (HLS) provides market-oriented applications for the fascinating world of life sciences. With a network of industry and research partners, the HLS is a unique university centred around technology development in medical, natural, environmental and engineering sciences. The state-of-the-art infrastructure facilitates translating cutting-edge research into practice. Benefits for patients, innovative products, intelligent solutions and environmentally friendly technologies are the ultimate goal.

The Master’s study programme combines lectures on applied life sciences with practical experience in an eight month Master’s thesis. The core of the life sciences study programme consists of scientific knowledge for research and development, coupled with practical experience. Students may assemble their own curriculum from available modules, with support from the HLS. In order to prepare optimally for a professional career, the study course also covers essential management skills. Graduates are ultimately expected to prove their abilities in a competitive and international life sciences environment and studies are therefore complemented by English language skills and the option of taking courses abroad.
The MSc (Master of Science) study programme gives graduates specialist knowledge enabling them to integrate quickly and effectively into the global industrial life sciences sector and related fields. MSc graduates have broad training and in-depth knowledge, combined with in-depth practical experiences. During the eight months of their MSc thesis, they demonstrate that they can work independently on demanding projects.

With these qualifications, graduates of the programme are able to plan and carry out projects in the fields of applied research, development, translational research and production. They are also aware of entrepreneurial issues such as budgeting, personnel, deadlines, markets and products.

Graduates are able to present and explain the results of their work in their native language and in English to other specialists as well as to colleagues with different backgrounds. They bring skills and knowledge to multi-disciplinary and interdisciplinary teams.

**New career prospects**
MSc graduates typically hold positions in organisations where they manage and participate in projects that build upon their expertise. Such organisations are active in chemistry, biotechnology, environmental protection and nutrition as well as pharmaceutical and medical technology. The Master of Science degree is internationally recognised and allows students to continue their studies with a doctorate in most countries.

**Qualified experts for the growing life sciences market**
The Master’s programme
Where life sciences come alive
The Master’s programme

The international Master of Science in Life Sciences is conducted in collaboration with other Swiss Universities of Applied Sciences: Berner Fachhochschule BFH, Haute Ecole Spécialisée de la Suisse Occidentale HES-SO and Zürcher Hochschule für angewandte Wissenschaften ZHAW.

Programme structure
The MSc study programme encompasses lectures (50 ECTS credits) and the thesis (40 ECTS credits). The Specialisation modules are offered by the School of Life Sciences FHNW and take place in Muttenz/Canton Basel-Landschaft. The Core competence modules and the Cluster-specific modules, which are organised in cooperation with the partner universities, are held in Olten and Bern.

The modules are offered during the semesters (see pages 12–13). All modules usually take place at least once a year. The students are supported by an innovative e-learning platform.

Study consultation
After acceptance, the Dean of the programme will consult each student regarding which modules shall be taken in which semester. Thus each student will have an individual study programme that best meets his/her interests. It is also possible to complete part of the course at a foreign institute of higher education: www.fhnw.ch/en/about-fhnw/schools/lifesciences/international/partner-universities.

Teaching language
The language of teaching is English. This requires that in addition to the technical and scientific skills applicants must be able to read scientific articles and books, follow the lectures, participate in discussions and be able to write the thesis in English on their own. Therefore, it must be emphasised that students who want to undertake the MSc programme need adequate skills in English (see also page 28).

Educational concept
The educational concept of “blended learning” combines independent learning with lessons on site. When preparing course contents, modern forms of teaching and learning such as e-learning and case studies are included. In seminars and workshops, students deal with challenging issues and differing points of view. Complex issues will be explained by the instructors in lessons. In the Master’s programme, great emphasis is put on “research learning,” where traditional teaching is augmented by individual context-based knowledge generation.

Start
The programme starts in the autumn semester (calendar week 38) or in the spring semester (calendar week 8).

Completion
Successful completion of the course leads to the award of the title “Master of Science” which is recognised around the world.

Learn more
The School of Life Sciences FHNW offers information evenings that provide more details about the MSc study programme. Please consult www.fhnw.ch/en/degree-programmes/lifesciences/master/info-events for more information and dates.
Specialisations
The Master’s programme

The School of Life Sciences FHNW offers five MSc specialisations:

**Bioanalytics**
Students are given a comprehensive bioanalytical education allowing them to take over responsibility in research and development in analytical laboratories, medical laboratories, clinics, contract research organizations and pharmaceutical companies. Modules cover the broad field of bioanalytics including the analysis of metabolites, environmental pollutants and proteins. High-throughput genome and RNA sequencing and the pharmacological and toxicological assessment of active pharmaceutical ingredients are also addressed. Further modules focus on cellular and whole organism bioassays and the use of organ chips and tissue engineering for drug discovery.

The studies conclude with an eight month Master’s thesis which is usually carried out in a company laboratory or at a foreign university or research institute. Alumni of the Master’s programme have ample theoretical and practical knowledge to start a career in research and development in companies or in specialized analytical laboratories.

**Chemistry**
Students receive an education in chemistry preparing them for a research or development position in the chemical and pharmaceutical industry. Modules focus on polymers and inorganic materials including their characterization by spectroscopic and imaging techniques and the tailoring of surfaces for bioanalytic and biomedical applications. Two further modules emphasize analytical techniques including advanced mass-spectroscopy, NMR spectroscopy and protein analytics. Students are also taught synthetic organic and medicinal chemistry and the chemistry of energy systems and storage. In all courses the importance of sustainability and safety in chemical production processes is addressed.

Students finish their studies with an eight month Master’s thesis. The thesis is commonly carried out in cooperation with a company or at a foreign university or research institute. Alumni of the Master’s programme have a sound theoretical and practical training enabling them to assume responsibility in R&D or production in the chemical industry.

**Pharmatechnology**
Students obtain a scientific and technical education in Pharmatechnology, which allows them to work in research, development or production in the pharmaceutical industry. Modules cover the formulation of drugs including biopharmaceuticals and the various routes of drug delivery. Another set of modules emphasizes the analytics required in the pharmaceutical industry. Students are taught protein analytics, compound profiling, advanced mass-spectroscopy and the use of tissue engineering for drug discovery. Further modules focus on production aspects: important subjects addressed are continuous pharmaceutical production and the design of (bio-)pharmaceutical production facilities.

Students conclude their studies in an eight month Master’s thesis. The thesis is usually carried out on the site of a pharmaceutical company or at a foreign university or research institute. Alumni of the studies have an excellent theoretical and practical education that allows them to take on responsibility in a pharmaceutical company.

**Biomedical Engineering**
Students receive a solid education in Biomedical Engineering, which enables them to work in research and development in a biomedical company. The modules taught prepare students to design and develop implants, medical devices, surgical robots as well as sensors for active implants. A number of modules also highlight the importance of the interface between implant and body. Students get insight into materials used for implants, their biocompatibility and surface characterization as well as the engineering of surfaces for biomedical applications. Further modules focus on the use of mathematical techniques for optimization, simulation, modelling as well as medical image analysis.

Together with an eight month Master’s thesis usually carried out in cooperation with a biomedical firm or at a foreign university or research institute. Alumni are well prepared to take on responsibility in a firm.
Environmental Technologies

Students acquire a comprehensive training in Environmental Technologies. Modules taught deal with the economic and environmental aspects of sustainable production, the concept of the circular economy, the analysis of material and mass flow as well as technologies for resource recovery. Two further modules address water resources: its management and the treatment of water and of wastewater. Students are also taught environmental risk assessment, where the fate and effects of environmental pollutants are addressed. Two additional modules focus on environmental remediation: pollutants in contaminated sites have to be managed, monitored and treated with physicochemical or biological techniques.

Students complete their studies with an eight month Master’s thesis that is usually done with an industrial partner or at a foreign university or research institute. Alumni have a thorough practical and theoretical education enabling them to develop, plan, apply and manage “clean” technologies in industry, in consulting or the public sector.
### Structure of the study programme

#### The Master’s programme

**Full-time students**

The MSc study programme comprises 90 ECTS credits. Shown here is a full-time study plan starting in the autumn semester (1.5 years):

**Part-time students**

It is also possible to study part time. In this case, the studies take approximately six semesters depending on the individual study plan. Part-time students may work in parallel – as a guideline 50 to 60 percent workload is appropriate. Other plans are possible; please consult the Dean.

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#### Programme structure full-time students

**Master’s thesis** 8 months from end of 2nd to 3rd semester  
40 ECTS credits

**Modules**  
min. 50 ECTS credits

<table>
<thead>
<tr>
<th>Core competences (see page 14, 15, 16–18)</th>
<th>Cluster-specific modules (see page 19–21)</th>
<th>Specialisation modules (see page 16–18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–7 modules of 3 ECTS are taken during the first two semesters</td>
<td>3–6 modules of 3 ECTS are taken during the first two semesters</td>
<td>5–9 modules of 3 ECTS are taken during the first two semesters</td>
</tr>
</tbody>
</table>

**Note:** It is possible that modules or final exams take place outside the semester.

#### Programme structure part-time students

**Master’s thesis** 8 months from end of 4th to 5th semester or 12 months from end of 4th to 6th semester  
40 ECTS credits

**Modules**  
min. 50 ECTS credits

<table>
<thead>
<tr>
<th>Core competences (see page 14, 15, 16–18)</th>
<th>Cluster-specific modules (see page 19–21)</th>
<th>Specialisation modules (see page 16–18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–7 modules of 3 ECTS are taken during the first four semesters</td>
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<td>5–9 modules of 3 ECTS are taken during the first four semesters</td>
</tr>
</tbody>
</table>

**Note:** It is possible that modules or final exams take place outside the semester.

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**Study plan**

#### Autumn semester

<table>
<thead>
<tr>
<th>Sep</th>
<th>Feb</th>
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</thead>
<tbody>
<tr>
<td>Lectures (1st sem.)</td>
<td>Lectures (2nd sem.)</td>
</tr>
<tr>
<td>Thesis (3rd sem., 8 months)</td>
<td></td>
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</tbody>
</table>

#### Spring semester

<table>
<thead>
<tr>
<th>Jun</th>
<th>Sep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thesis (8 months)</td>
<td></td>
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</tbody>
</table>

**Note:** It is possible that modules or final exams take place outside the semester.

**Study plan**

#### Autumn semester

<table>
<thead>
<tr>
<th>Sep</th>
<th>Feb</th>
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</thead>
<tbody>
<tr>
<td>Lectures (1st sem.)</td>
<td>Lectures (2nd sem.)</td>
</tr>
<tr>
<td>Thesis (3rd sem., 8 months)</td>
<td></td>
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</tbody>
</table>

#### Spring semester

<table>
<thead>
<tr>
<th>Jun</th>
<th>Sep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures (3rd sem.)</td>
<td>Lectures (4th sem.)</td>
</tr>
<tr>
<td>Thesis (5/6th sem., 8 or 12 months)</td>
<td></td>
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</tbody>
</table>
The Core competence modules are designed to introduce students to the life sciences industry, focusing on professional life within the industry as well as providing insight into data handling and analysis techniques.

**Business, Management and Society**
Three of the modules – Business Administration, Management and Leadership, and Project and Innovation Management – focus on providing an understanding of how Life Sciences companies function. In contrast, the fourth module is devoted to the social, political and ethical context within which Life Sciences companies operate.

Students who complete these modules will have an understanding of how Life Sciences companies work, how they are managed, and how they are led. They will therefore be aware of diverse entrepreneurial issues and be thoroughly prepared for a career in the industry.

**Data**
The three “Data” Core competence modules (Handling and Visualizing Data, Design and Analysis of Experiments and Modelling and Exploration of Multivariate Data) reflect the increasing importance of information in all technical and scientific areas. Today more and more data is generated and gathered than ever, and it needs to be skillfully analyzed in order for companies to profit from it. In these three modules students are trained to plan and design experiments, to handle large data sets, to visualize them, and to analyze them with state-of-the-art methods. All modules use “R”, a powerful and open software suite for data analysis.

After having completed the data modules students will have acquired all the necessary competences to analyze their own data, to prepare high quality figures for meaningful data visualization, and to select and apply the appropriate methods for data analysis.
<table>
<thead>
<tr>
<th>Module Offer</th>
<th>Cluster-Specific Modules</th>
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</thead>
<tbody>
<tr>
<td><strong>Module</strong></td>
<td><strong>Day</strong></td>
</tr>
<tr>
<td>Modelling of Complex Systems</td>
<td>AS-1</td>
</tr>
<tr>
<td>Machine Learning and Pattern Recognition</td>
<td>AS-2</td>
</tr>
<tr>
<td>Optimisation Methods</td>
<td>SS-1</td>
</tr>
<tr>
<td>Medical Imaging and Image processing</td>
<td>SS-2</td>
</tr>
<tr>
<td>Materials Science</td>
<td>AS-1</td>
</tr>
<tr>
<td>Surface Characterisation</td>
<td>AS-2</td>
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<tr>
<td>Modelling of Complex Systems</td>
<td>Wednesday</td>
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<tr>
<td>Machine Learning and Pattern Recognition</td>
<td></td>
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<tr>
<td>Optimisation Methods</td>
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<tr>
<td>Medical Imaging and Image processing</td>
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<tr>
<td>Materials Science</td>
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<tr>
<td>Surface Characterisation</td>
<td></td>
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<tr>
<td>Modelling of Complex Systems</td>
<td>Thursday</td>
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<tr>
<td>Machine Learning and Pattern Recognition</td>
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<tr>
<td>Optimisation Methods</td>
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<tr>
<td>Medical Imaging and Image processing</td>
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<td>Materials Science</td>
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<tr>
<td>Surface Characterisation</td>
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<tr>
<td>Modelling of Complex Systems</td>
<td>Friday</td>
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<tr>
<td>Machine Learning and Pattern Recognition</td>
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<tr>
<td>Optimisation Methods</td>
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<tr>
<td>Medical Imaging and Image processing</td>
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<td>Materials Science</td>
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<tr>
<td>Surface Characterisation</td>
<td></td>
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<tr>
<td>Modelling of Complex Systems</td>
<td>Saturday</td>
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<tr>
<td>Machine Learning and Pattern Recognition</td>
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<tr>
<td>Optimisation Methods</td>
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<td>Medical Imaging and Image processing</td>
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<tr>
<td>Materials Science</td>
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<tr>
<td>Surface Characterisation</td>
<td></td>
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<tr>
<td>Modelling of Complex Systems</td>
<td>Sunday</td>
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<tr>
<td>Machine Learning and Pattern Recognition</td>
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<tr>
<td>Optimisation Methods</td>
<td></td>
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<tr>
<td>Medical Imaging and Image processing</td>
<td></td>
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<tr>
<td>Materials Science</td>
<td></td>
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<tr>
<td>Surface Characterisation</td>
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**Cluster Chemistry**

- **Materials Science**
- **Surface Characterisation**
- **Chemistry and Energy**
- **Green Chemistry**
- **Industrial Chemical Process Safety**

**Cluster Bio/Pharma**

- **Compound Profiling in Pharmaceutical Drug Discovery**
- **Drug Formulation and Delivery for Solid Dosage Form**
- **Design of Biopharmaceutical Production Facilities**
- **Biosimilars in a regulated Environment**
- **Physiology and Immunotherapies**
- **Tissue Engineering for Drug Discovery**
- **Regulatory Affairs**

**Cluster Environment**

- **Journal Club Environmental and Natural Resource Sciences**
- **Life Cycle Assessment**
- **Sustainable Development Natural Resource Management**
- **Ecological Infrastructure in Landscapes**
- **Biodiversity**
- **Water Management in Households, Industry and Agriculture**

**Cluster Food**

- **Journal Club Food and Nutrition Sciences**
- **Proximes in Food Processing**
- **Advanced Sensory Techniques**
- **Foodomics**
- **Sustainable Sourcing, Processing and Tracing of Food**
- **Nutrition and Nutrition Related Chronic Diseases**

**Specialisations**

- **Biomedical Engineering**
- **Chemistry**
- **Bioanalytics**
- **Pharma-technologies**
- **Environmental Technologies**

**Contents**

- System theory, system dynamics, modelling software tools, numerical integration methods, Monte Carlo simulation
- Maximum likelihood, graphical modelling, calculation, ensemble methods
- Linear, non-linear, discriminant and stochastic optimisation methods, Matlab exercises
- Quantitative image processing, segmentation, registration, calculation
- Multiscale materials, nanomaterials and electronics, materials, structure, elastic mechanical and magnetic properties, metal and ceramic materials, nanomaterials
- Modern imaging and novel sensors for medical applications. Biological imaging, optical and infrared spectroscopy, XDA, XRD, XAFS, spectroscopy with surfaces (XPS, TOF-SIMS)
- Polymer synthesis, polymer characterization, biaxial, polymer processing
- Functional energy storage, bioenergy, photovoltaics, photobiology, energy, fuel cells
- Green chemistry metrics, industrial green chemistry, green scores
- Process safety in the chemical industry, case studies
- Legal aspects related to intellectual property, healthcare, MAH, technology assessment, validity of test models, extrapolation methods
- Innovation: Development, technology transfer, controlled release technologies, peel-off drug delivery, formulation of post-foodable drugs, biopharmaceutical modeling
- Facility concept, modularisation of production facilities, line concept, regulatory aspects, supply chain, automation
- Regulatory affairs, technology transfer, analysis of a product in a phase of a test method, monographs for biopharmaceuticals, GMP requirements, analytical LDT
- Quality management in production and development, license application processes
- Laboratory aspects of rapid tests, correlation of blood plasma data and pharmaceutical medications, protein-based analysis
- Advanced engineering techniques, bioprocessing, risk, systems testing, engineered rate and durability, cancer models
- Scientific publishing, reading and presenting seminal publications, discussion and end-of-group of related publications
- Additional examples of LDA, use of chemical analysis and related regulations, steps of an LDA procedure
- Food conflicts in natural resource management, challenges
- Analytical and investment ecology, life cycle, ecological infrastructure, ecological connectivity, land-use planning
- Food engineering, intelligent monitoring of food, ecosystems, food technologies, quality control
- Water resources, water supply and distribution, water use, water cycle management
- Scientific publishing, reading and presenting seminal publications, discussion and end-of-group of related publications
- Food processing techniques, possibilities in shelf-life extension and micro-enzymation
- Innovative sensory evaluation methods, analysis of sensory data, cognitive and psychophysical aspects of perception
- Algorithmic test and diagnosis, techniques for cross-over, microflora and measurements, data mining
- Process analysis, sustainable agriculture, process aspects, smoking, energy management, sustainable diet, sustainable food, food quality indicators
- Sustainable health and wellbeing, epidemics, diet as risk factor for diseases, public health approaches

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* Organised by the School of Life Sciences

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<table>
<thead>
<tr>
<th>Organised by the School of Life Sciences</th>
<th>Autumn Semester</th>
<th>Spring Semester</th>
<th>Elective modules (1st choice)</th>
<th>Elective modules (2nd choice)</th>
<th>Elective modules (3rd choice)</th>
<th>Elective modules (4th choice)</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>20</td>
<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
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</table>
## Study Regulations

### General information

<table>
<thead>
<tr>
<th>Module</th>
<th>Requirements</th>
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<tbody>
<tr>
<td><strong>Specialisation modules</strong></td>
<td>compulsory elective depending upon given major (page 23)</td>
</tr>
<tr>
<td><strong>Cluster-specific modules</strong> (FHNW &amp; cooperation)</td>
<td>min. 9 ECTS</td>
</tr>
<tr>
<td><strong>Core competences</strong></td>
<td>min. 15 ECTS</td>
</tr>
<tr>
<td><strong>Master’s Thesis</strong></td>
<td>40 ECTS</td>
</tr>
<tr>
<td><strong>Other elective modules</strong> (University of Basel, etc.)</td>
<td>max. 12 ECTS (30 ECTS for an exchange semester) Modules which are credited need to be agreed by the Dean.</td>
</tr>
</tbody>
</table>

### Compulsory Elective Modules for each Specialisation

#### Biomedical Engineering at least five of the modules:
- Implant Design and Manufacturing
- Biointerface Engineering
- Sensors and Signal Processing
- Materials Sciences
- Medical Device Development
- Optimisation Methods
- Surgical Robotics

#### Chemistry at least five of the modules:
- Synthetic and Medicinal Chemistry
- Advanced Mass Spectrometry and NMR Spectroscopy
- Process Development and Technology
- Reaction Technology
- Proteomics and Protein Analytics
- Materials Sciences
- Surface Characterisation

#### Bioanalytics at least three of the modules:
- Bioassays: Engineered Cells, Tissues and Organisms
- Compound Profiling in Pharmaceutical Drug Discovery
- Advanced Mass Spectrometry and NMR Spectroscopy
- Genomics
- Proteomics and Protein Analytics

#### Pharmatechnology at least four of the modules:
- Bioassays: Engineered Cells, Tissues and Organisms
- Compound Profiling in Pharmaceutical Drug Discovery
- Continuous Pharmaceutical Production
- Drug Formulation and Delivery for Solid Dosage Forms
- Pharmaceutical Production Facilities
- Formulation of Biologics and Routes of Drug Delivery

#### Environmental Technologies at least five of the modules:
- Cost Effectiveness of Sustainable Production and Risk Reduction in Industries
- Environmental Risk Assessment
- Material Recovery Methods and Technologies
- Environmental Bioremediation
- Industrial Pollution Control and Resource Recovery Applications
- Environmental Remediation
- Water and Wastewater Treatment Technologies
- Water Management in Households, Industry and Agriculture

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22

23
The Master’s thesis

Amounting to 40 ECTS points, the thesis is the most important module of the MSc programme. It addresses a scientific or technical question of practical relevance and is carried out either at an institute of the School of Life Sciences FHNW, at the site of an industrial partner or at a foreign university or research institute. In all cases, the student is supervised by a member of the school’s faculty.

The thesis has to be written in English and lasts eight months in full-time study.

Our Partner Schools

The School of Life Sciences has over 40 international partner schools (www.fhnw.ch/en/about-fhnw/schools/lifesciences/international/partner-universities) all over the world. Students may spend one semester at a foreign University in selected MSc programmes. In addition, it is possible to perform the Master’s thesis abroad. The School of Life Sciences is partner of the SEMP (Swiss European Mobility Programme) which supports student exchanges within Europe.

**Double-Degree with UTC Prague**
Selected students on our Master’s programme can complete a double degree by taking an additional semester at the UCT Prague, earning them the two titles of MSc in Life Sciences FHNW and MSc in Drug Synthesis and Manufacturing UCT Prague.

**Double-Degree with Linköping University**
Selected students of our Master’s programme in specialisation chemistry can complete a double degree by taking an additional semester at the Linköping University, earning them the two titles of MSc in Life Sciences FHNW and MSc in Chemistry from the University of Linköping.

**Cooperation with the University of Basle**
Students of the MSc programme may visit lectures offered by the University of Basle. Up to 12 ECTS can be gained in this way. Please consult the Dean for details.
Basel—Centre of the global Life Sciences Industry

The School of Life Sciences FHNW in Muttenz (Canton Basel-Land) is situated in one of the global centers of the life sciences industry. Several international companies have their headquarters in the Basel area, e.g. Roche, Novartis, Clariant, Straumann and Syngenta, to name just a few. Apart from these, around 600 other companies in the life sciences sector conduct development, research or production in the Basel area. Together they offer approximately 30,000 high-powered jobs.

The lecturers of the School of Life Sciences cooperate closely with local industry in joint projects. In addition, the majority of Bachelor’s and Master’s theses are completed with a partner in industry. And the Basel area is not only attractive with regard to job opportunities but is also part of the vibrant Rhine valley region where Switzerland, France and Germany meet and which offers many options for entertainment and leisure activities.
**Terms of admission**

As a rule, outstanding bachelor’s degree qualifications are accepted for the MSc programme.

Candidates will be admitted without an entry examination if they have
- gained a BSc in a related subject and graduated with grade A, B or \( \geq 5 \), or demonstrated an equivalent qualification equivalent qualification (\( \leq 2.5 \) for Germany/Austria)
- adequate English skills

Motivated students who do not fulfil the entry requirements entirely might be invited for an assessment interview.

Adequate English competency has to be proven with one of these certificates:

<table>
<thead>
<tr>
<th>Type of certificate</th>
<th>Required level</th>
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<tbody>
<tr>
<td>FCE (First Certificate English)</td>
<td>FCE</td>
</tr>
<tr>
<td>IELTS (English Language Testing System)</td>
<td>5.5</td>
</tr>
<tr>
<td>TOEFL (Test of English as a Foreign Language)</td>
<td>iBT 71</td>
</tr>
<tr>
<td>Intermediate or Spoken/Written Academic English</td>
<td>5.0</td>
</tr>
</tbody>
</table>

In the case of a lower English level, the applicants are admitted but have the obligation to improve their English during the Master’s course. They may attend the Advanced English course offered by the School of Life Sciences or may attend other courses. At the end of the studies, students have to prove that they have attained the required English level (see table above).
Fees and grants
General information

<table>
<thead>
<tr>
<th>Fees and expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition fees per semester for students domiciled in a Swiss canton, the Principality of Liechtenstein*</td>
</tr>
<tr>
<td>For students who are legally resident in the EU/EFTA at the start of their studies, the semester fees are</td>
</tr>
<tr>
<td>Tuition fees per semester for all other students</td>
</tr>
<tr>
<td>Enrolment fee</td>
</tr>
<tr>
<td>Graduation fee</td>
</tr>
</tbody>
</table>

It is expected that students own a notebook PC.

Grants
In Switzerland, grants are regulated on a cantonal basis. The canton of your place of residence decides on grants or interest-free loans. In addition to public grants, there are also private institutions that award scholarships.

* Fees of CHF 700 are payable by those students whose parents or guardians are in Switzerland, Liechtenstein; who are citizens of Switzerland, Liechtenstein; who for the previous two years were financially independent due to being employed in Switzerland, Liechtenstein and who did not undertake any higher or further education in this time.

FHNW University of Applied Sciences and Arts Northwestern Switzerland
General information

The FHNW University of Applied Sciences and Arts Northwestern Switzerland is a leading education and research institution with strong links to the surrounding region. It is one of the most innovative universities of applied sciences in Switzerland.


More than 12,500 students are enrolled at the FHNW campuses in the cantons of Aargau, Basel-Land, Basel-Stadt and Solothurn. Around 800 lecturers teach 29 bachelor’s and 17 master’s degree courses as well as a range of practical and market-focused continuing education programmes. FHNW graduates are highly sought-after specialists.

Application-oriented research and development has an equally high priority at the FHNW. With national and international partners from industry, business, culture, government and institutes, the FHNW runs research projects and is an active participant in European research programmes. The FHNW supports the transfer of expertise and technology to firms and institutions: in 2018, application-oriented research and development included 1251 research projects and 371 service projects.
We are at your service
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