Biology

Degree conferred
Master of Science in Biology

Options
Four options available:

- Biochemistry
- Ecology and Evolution
- Animal Molecular Life Sciences
- Plant and Microbial Sciences

Languages of study
Study in English

Commencement of studies
Commencement of studies in the Autumn Semester (September) or in the Spring Semester (February)

Access to further studies
This Master programme qualifies students also for the Doctoral programme Medical Sciences

The Department of Biology of the Faculty of Science offers four different orientations for the Master of Science in Biology:

1. **Biochemistry**
   - The orientation Biochemistry, puts special emphasis on biomolecules regulating the internal clock, food sensing and growth control, lipid metabolism, ribosome biogenesis, membrane lipids and carbohydrates. The organisms studied are the mouse and the unicellular eukaryotic fungus *Saccharomyces cerevisiae* (Baker's yeast). Both allow a fascinating and detailed study of gene function and regulation of homeostasis;

2. **Ecology and Evolution**
   - This orientation promotes higher education and research in organismic biology, in particular in ecology and evolution. Current research interests of members of the unit include food web structure, conservation biology, invasive species, agro-ecology, host-parasite interactions, life-history evolution, inbreeding depression, evolution in fragmented habitats, and population genetics. The organisms investigated are whole food webs, water fleas (*Daphnia*), horse chestnut leaf miner (*Cameraria*), as well as plants: spotted knapweed (*Centaurea stoebe*), groundsel (*Senecio*), false hellebore (*Veratrum*), dock (*Rumex*), poplar (*Populus*) and their natural enemies;

3. **Animal Molecular Life Sciences**
   - This orientation is centred on the mechanisms that govern animal development in the following animal model systems: The fruit fly *Drosophila melanogaster*, the nematode *Caenorhabditis elegans*, the zebra fish *Danio rerio* and the mouse. Research groups investigate molecular aspects of regeneration, cell differentiation, neuronal outgrowth and connectivity, behaviour, chemoreceptors, and aging. The tools employed are molecular genetics, molecular biology, protein analysis, microscopy and imaging, behavioural analysis and many more;

4. **Plant and Microbial Sciences**
   - This orientation emphasizes the cellular and molecular aspects of pathogenic and symbiotic plant-microbe interactions. The research groups focus on aspects ranging from the recognition of microbes by the plants, initiation of defences, metabolic and hormonal adjustments, and interference of the microbe with the host defences. A gamut of modern tools are used in the areas of molecular biology, reverse genetics, imaging and biochemistry. The training
both in practical and theoretical areas will prepare the
students for the challenge of the professional world.

Academic and professional openings
Graduates find job opportunities for example as researchers in
biotech companies, or in laboratories for quality control
(pharmaceutical or agroalimentary industry), as environmental
research consultant, biosafety officer or scientific collaborator at
various offices and departments of the Swiss Confederation, sales
representative for biotech companies, college teachers and many
other jobs in fields as diverse as crop protection, animal and human
health, or in areas linked to the environment. In short, with a
Master's degree in Biology, you can apply for positions that require
a solid knowledge in biology, the ability to communicate and to view
science under a critical angle, and some practical experience and
skills. The Master's degree also paves the way to doctoral studies
(Ph.D.). During their Ph.D., students learn how to conduct
independent research. During the period of 3-4 years, the Ph.D.
student receives a salary and is exposed to the international
research community through meetings and publications. Doctoral
studies followed by a postdoctoral experience represent the typical
way to access academic positions as well as positions in the upper
management of industry in Switzerland and abroad.

Studies organisation

Structure of studies
90 ECTS credits, 3 semesters

Curriculum
http://studies.unifr.ch/go/xZPll
http://studies.unifr.ch/go/z3FE1

Admission

Master's degree programmes are built on the knowledge and
abilities that were acquired when obtaining a Bachelor's degree.

Holders of a Bachelor's degree awarded from a Swiss university

programme are reserved.

Alternatives
Also offered as a minor study programme (30 ECTS credits) as part
of the Diplôme d'Enseignement pour les Ecoles de Maturité
(DEEM)/Lehrdiplom für Maturitätsschulen (LDM).

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http://studies.unifr.ch/enmaster/sci/biology,master/sci/biochemistry

The respective conditions of admission for each Master's degree