Physics

Degree conferred
Master of Science in Physics

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**

At master's level, this study programme in physics provides students with advanced courses and starts the process of specialisation. About half of the courses are compulsory and of general interest, the other half consists of more specialised elective courses.
The master's thesis will be supervised by an active researcher and initiates students to the frontiers of research, in the following subjects: Atomic physics, Electrons in solids, Soft matter and photonics, Theoretical interdisciplinary physics, Collective quantum phenomena and Nanosciences (Nanomaterials).
At the end of the programme, students will have learned how to apply their knowledge to do research projects and how to work independently or integrate into an interdisciplinary research team.

Profile of the study programme

Physics has been the main motor of the spectacular scientific and technological developments of the 20th century and will definitely continue to play a dominant role for the promotion of science at large in this century.
The study programme in physics provides you with more advanced courses, and starts the process of specialisation. The master's thesis is supervised by an active researcher and initiates you to the frontiers of research. At the master's level, about half of the courses are compulsory and of general interest, the other half consists of more specialised elective courses. Specialised lectures may also be taken at other universities, in particular Bern. It is recommended that you follow the specialised lectures in the field of your future master's thesis. Other lectures, at your discretion, are necessary to complete the requirements. The lectures are complemented by seminars on modern research topics and advanced laboratory work, colloquia and project in research group.

Compulsory courses:

- *Theoretical physics*: Relativistic quantum mechanics, Field theory, Many-body theory;
- *Condensed matter physics*: Magnetism and quantum fluids, Soft condensed matter;
- *Constituents of matter*: Electrons and photons, Atomic spectroscopy, Modern optics.

Elective courses:

- *Specialised courses* (examples): Optics of strongly scattering media, Physics of living matter, Interdisciplinary statistical physics, Advanced materials, Polarised light and polarised atoms, Solid state magnetism, Colloid physics, Astrophysics, Solid state spectroscopy, Polymer physics, Symmetries in physics, Atomic collisions, Scattering methods in soft condensed matter, Theories of high temperature superconductors, Physics of information, Critical phenomena, Exotic atomic transitions, Magneto-optical effects in atoms, Synchrotron radiation;
- *Other courses*: at the discretion of the student (for example, a course in Scientific English).

Master's thesis
Subject in following fields: Atomic physics, Electrons in solids, Soft matter and photonics, Theoretical interdisciplinary physics, Collective quantum phenomena and Nanosciences (Nanomaterials).

6 good reasons to study at the University of Fribourg:

- International environment;
- Human scale of the Department of Physics;
- Excellent supervision of the students;
- Bilingualism (French/German) and master's level courses taught in English;
- The Department is composed of several relatively small research groups, each with its own specialty, therefore wide choice's possibility of subjects for the master's thesis;
- Proximity of the University of Bern, easy access to lectures on other topics.

Learning outcomes and career openings
The aim of the studies leading to the award of a Master of Science in Physics is to deepen knowledge and perfect competence in the chosen field and at the same time develop skills in scientific English.
At the end of the study programme, you will have shown that you can apply your knowledge to accomplish a research project and will have learned how to work independently or how to integrate into an interdisciplinary research team.
The award of the degree requires creative and self-critical talents as well as the ability to communicate ideas and work both in English and your native language.

The master's degree in Physics opens many doors, a natural choice being doctoral studies. A Ph.D. degree is necessary or advantageous f or continuing work in academic or industrial research positions. Teaching at secondary level is another obvious choice (see «Teacher Education for Secondary Level»).
Learning scientific rigor, abstract thinking, experimental and mathematical skills, the ability to describe concrete phenomena by

theoretical models, the ability to identify relevant variables, are skills of good standing in the search for employment in both the public and private sectors. Branches where physicists are welcome include machine and electronic industries, applied computing, insurance companies, risk management and even financial mathematics. Besides those typical careers, physicists frequently appear in important managerial positions or in politics.

Studies organisation

Structure of studies

90 ECTS credits, 3 semesters

Curriculum

http://studies.unifr.ch/go/vBvMa

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 by a Swiss university are admitted to a master's degree programme without any preconditions if they have earned 60 or 90 ECTS credits – depending on the chosen master's degree programme – within the corresponding discipline. However, additional requirements can be required. The same applies to holders of a bachelor's degree awarded by a foreign university, provided that the bachelor's degree is recognised and considered equivalent by the University of Fribourg.

Holders of a bachelor's degree awarded by a Swiss or a foreign university, provided that the bachelor's degree is recognised and considered equivalent by the University of Fribourg, who do not fulfil this condition can be admitted to a master's degree programme with preconditions (which must be successfully completed before starting the master's degree programme) and/or additional requirements (which can be completed during the master's degree programme). The preconditions and/or additional requirements may not exceed 60 ECTS credits in total. The same applies to holders of a bachelor's degree awarded by a Swiss university of applied sciences, according to existing agreements.

The respective conditions of admission for each master's degree 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).

Contact

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