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
photons, Theoretical interdisciplinary physics, Collective quantum
phenomena and Nanosciences (Nanomaterials).

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**: Advanced statistical mechanics,
- **Relativistic quantum mechanics**, **Field theory**, **Many-body
  theory**;
- **Condensed matter physics**: Structure and dynamics of
  matter, Magnetism and quantum fluids, Soft condensed
  matter, Electrons in solids;
- **Constituents of matter**: Electrons and photons, Particle
  physics, 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 for 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/xZPll (French)
http://studies.unifr.ch/go/z3FE1 (German)

**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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