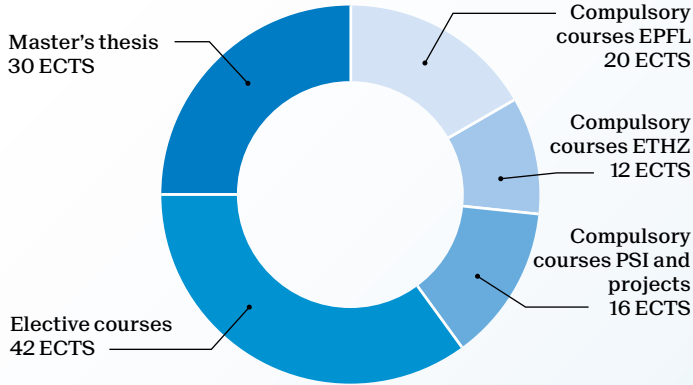


Master of Science in NUCLEAR ENGINEERING

Joint master EPF Lausanne - ETH Zürich

2-year program - 120 ECTS



- 1st semester at EPFL
- 2nd semester at ETHZ
- 3rd semester at PSI (Paul Scherrer Institute)

Teaching language: English

CAREER PROSPECTS

After graduation, the Master of Nuclear Engineering's students will have the perfect profile to start a career in industry, research institutes and national authorities, in Switzerland and abroad. Your internationally recognized degree, and experience from the cultural life in two attractive and diverse cities of Switzerland, allows you to become a well-recognized member of the international community of nuclear engineers. If you are interested in an academic career, the Master of Nuclear Engineering is also an ideal stepping stone to join a PhD program in nuclear engineering implemented as an EPFL-ETHZ-PSI collaboration.

Career options are as wide as follow: Development of Generation IV reactors / Medical imaging / Instrumentation for fusion technologies / Accelerator driven systems for transmutation / Spallation neutron sources / Safety of light water reactors / Environmental monitoring / Radiation protection / Reprocessing and partitioning / Computational fluid dynamics / Neutron transport modeling / Development of two-phase flow instrumentation / New nuclear fuel materials, and many others.

ADMISSION GUIDELINES

You are: A Bachelor student of Science in Mechanical Engineering, Physics, Chemistry, Electrical Systems or similar / ready to work interdisciplinary / concerned about sustainability / interested in power engineering, biomedical applications, nuclear physics, thermal fluid dynamics, material sciences, radiation detection, and energetic aspects. The following required admission profile is expected to be met by the largely common elements of the first years of university education in science and engineering:

- Minimum required credits in "Mathematics": 18 ECTS or equivalent hours/week
- Minimum required contents in "Natural Sciences": 12 ECTS or equivalent hours/week
- Minimum required contents in "Engineering Sciences": 12 ECTS or equivalent hours/week

| | Credits |
|---|--------------|
| Compulsory courses EPFL | 20 |
| Course of entrepreneurship | 4 |
| Neutronics | 4 |
| Radiation and reactor experiments | 4 |
| Radiation biology, protection and applications | 4 |
| Reactor technology | 4 |
| Compulsory courses ETHZ | 12 |
| Nuclear energy systems | 4 |
| Nuclear materials | 4 |
| Safety of nuclear power plants | 4 |
| Compulsory courses PSI | 16 |
| Engineering Internship for Nuclear Engineering | 8 |
| Semester project for Nuclear engineering | 8 |
| Elective courses | 42 |
| Elective courses EPFL | |
| Energy conversion and renewable energy | 3 |
| Hydraulic turbomachines | 4 |
| Introduction to medical radiation physics | 4 |
| Introduction to particle accelerators | 4 |
| Nuclear fusion and plasma physics | 4 |
| Physics of atoms, nuclei and elementary particles | 4 |
| Radiation detection | 3 |
| Elective courses ETHZ | |
| Advanced Techniques for the Risk Analysis of Technical Systems | 4 |
| Biomedical imaging | 6 |
| Computational multi-phase thermal fluid dynamics | 4 |
| Computational neuroimaging clinic | 3 |
| Introduction to quantum mechanics for engineers | 4 |
| Magnetic resonance imaging in medicine | 4 |
| Materials analysis by nuclear techniques | 6 |
| Medical physics II | 6 |
| Micro and nano-tomography of biological tissues | 4 |
| Monte Carlo in medical physics | 4 |
| Multiphase flow | 4 |
| Physics against cancer: the physics of imaging and treating cancer | 6 |
| Radiation-based imaging methods for nuclear and industrial applications | 4 |
| Renewable energy technologies II, energy storage and conversion | 4 |
| Special topics in reactor physics | 4 |
| Therapeutic applications of particle physics: principles and practice | 6 |
| Elective courses PSI | |
| Advanced topics in nuclear reactor materials (block course) | 4 |
| Beyond-design-basis safety (block course) | 3 |
| Decommissioning of nuclear power plants (block course) | 4 |
| Nuclear Computations Lab | 3 |
| "Free" elective courses | max 8 |
| Master courses from the catalogue of courses EPFL or ETHZ (provided the tutor supports this choice) | |
| Elective project | 8 |

Fluency in English is required, since all courses are being taught in English. Success in an international examination of English such as the TOEFL is a plus but not mandatory for the admission to the MNE.

Applications can be submitted online twice every year, from November 1 to January 15 and from January 16 to April 15, through EPFL or ETHZ procedures.

If you need a visa to study in Switzerland, we recommend that you apply for the December deadline in order to allow for the completion of the visa procedure, which can take up to three months.

Contacts:

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