Master of Science in
NUCLEAR ENGINEERING
Joint master EPF Lausanne - ETH Zürich
2-year program - 120 ECTS

Compulsory courses EPFL
20 ECTS
Neutronics
Reactor experiments
Reactor technology
Radiation protection & radiation applications
Course of entrepreneurship

Compulsory courses ETHZ
12 ECTS
Nuclear energy systems
Nuclear materials
Safety of nuclear power plants

Compulsory courses PSI and projects
16 ECTS
Semester project for Nuclear engineering
Engineering Internship for Nuclear Engineering

Elective courses
42 ECTS

Elective courses EPFL
Energy conversion and renewable energy
Hydraulic turbomachines
Introduction to particle accelerators
Medical radiation physics
Nuclear fusion and plasma physics
Physics of atoms, nuclei and elementary particles
Radiation detection

Elective courses ETHZ
Advanced Techniques for the Risk Analysis of Technical Systems
Computational multi-phase thermal fluid dynamics
Computational neuroimaging clinic
Introduction to quantum mechanics for engineers
Magnetic resonance imaging in medicine
Materials analysis by nuclear techniques
Monte Carlo in medical physics
Multiphase flow
Physics against cancer: the physics of imaging and treating cancer
Radiation-based imaging methods for nuclear and industrial applications
Renewable energy technologies II, energy storage and conversion
Single- and Two-Phase Particulate Flows
Special topics in reactor physics
Therapeutic applications of particle physics:principles and pratice

Elective courses PSI
Advanced topics in nuclear reactor materials
Beyond-design-basis safety
Decommissioning of nuclear power plants (block course)
Nuclear Computations Lab

"Free" elective courses max 8
Master courses from the catalogue of courses EPFL or ETHZ (provided the tutor supports this choice)
Elective project 8

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

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 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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