SUPSI

Master of Science in Engineering

The Swiss Engineering Master’s Degree

www.msengineering.ch
The Master of Science in Engineering (MSE) offers you the highest possible degree from a Swiss University of Applied Sciences in the areas of Engineering, Information Technology and Construction & Planning. The MSE trains both technical and management leaders, destined for careers in industry and the public sectors. Students acquire the skills needed for careers in departments such as research and development, production, logistics, consultancy and public institutions and are capable of taking responsibility for managing interdisciplinary projects. The MSE is developed by the Department of Innovative Technologies of SUPSI together with all public Universities of Applied Sciences in Switzerland. Each UAS contributes with its own particular strengths and competences to the overall study program.

**Why MSE?**
- Develop skills and ability to face and solve complex problems
- Teamwork experience within SUPSI-DTI research groups and projects
- Work with the state of the art technology
- Mobility: opportunity to live an experience abroad
- Benefit from DTI’s strong relationship with companies and institutions
- Part-time model (combination of study and work)

**MSE: facts and figures**
- 15 profiles offered in all engineering disciplines
- Strong cooperation between the 8 Swiss UAS
- 135 theory modules
- Full-time and Part-time study
- Focus on practice

**Course structure**
The Master’s degree program is structured on a modular basis and represents 90 ECTS credits. The theoretical part of the program accounts for at least one third of the credits; the other two thirds are acquired through supplementary lectures and modules, projects and especially by completing a Master’s thesis. The focus is on practice. In the MSE program you will be actively involved in current research projects being performed at the UAS. You will generally write your Master’s thesis in cooperation with an industrial company.

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### Course structure

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The MSE offers 15 profiles in all engineering disciplines. The following profiles are offered by SUPSI.

**Aviation**
The aviation industry faces new challenges from innovative technologies and an increasing demand for global mobility in a context of sustainable development. Through the MSE profile in Aviation, you will acquire the in-depth knowledge and methodological skills to address these challenges with interdisciplinary know-how in an international environment.

**Subject areas:**
- Operation: Aviation Infrastructure Operation and Future Mobility
- Technology: Advanced Aircraft Systems and Towards Unmanned Aviation

**Business Engineering**
From material procurement to the finished product, from market analysis to service: with the MSE profile in Business Engineering you will be prepared to successfully take on challenging tasks in industry or in the services sector.

**Subject areas:**
- Technology and innovation management
- Operations and production management
- Service engineering
- Business and production analysis
- Supply chain management
- Life cycle management

**Civil Engineering**
As a civil engineer, you are building the future. The buildings that you plan and execute will shape our living spaces.

**Subject areas:**
- Structural engineering
- Geotechnical engineering
- Hydraulic engineering
- Transport planning and systems

**Computer Science**
The ongoing digitalization in all aspects of life demands well-trained specialists. With the MSE profile in Computer Science, you can actively shape this development.

**Subject areas:**
- Software engineering and technology
- Distributed information systems
- Cybersecurity
- Advanced user interfaces
- Embedded computing
- Communication systems

**Data Science**
Data form the basis for many products and services that shape our everyday lives. The MSE profile in Data Science provides you with the most important methods and tools to process and efficiently organize data, analyze them and use them to generate innovative data-driven products.

**Subject areas:**
- Data analytics
- Data engineering
- Data-driven products and services

**Electrical Engineering**
The future will be smart, and you can shape it with products that are just as smart – from the tiniest components to huge grids.

**Subject areas:**
- Electronic systems
- Embedded systems
- Signal processing
- Control engineering
- Communication and information systems
- Power electronics systems
- Electrical machines and drive systems
- Electrical power transportation and distribution

**Energy & Environment**
In order to tackle climate change sustainably, the most advanced technologies are necessary – especially in the energy sector. The MSE profile in Energy and Environment trains engineers to meet this challenge.

**Subject areas:**
- Power generation
- Design, operation, control and optimisation of physical, chemical and biomass-based processes
- Mechanical, thermal and chemical process engineering
- Circular economy and energy recovery
- Sustainable treatment of air, water and waste
Specialisation profiles

Mechanical Engineering
Switzerland is a world leader for the machinery industry. With a specialisation in Mechanical Engineering, you will be highly sought after in one of the most important branches of development and production.

**Subject areas:**
- Conceptual development, design, construction, modelling, testing, measurement, validation, and optimisation of components, modules, or entire systems
- Development methods and production technologies
- Energy efficiency, and ecological and social sustainability
- Product life cycle knowledge
- Material knowledge

Mechatronics & Automation
Mechatronic technologies and automation are needed in many industries. As a result, the demand for specialists is high. With the MSE in Mechatronics and Automation, you will be well prepared for a career in industry.

**Subject areas:**
- Industrial systems
- Mechatronic devices
- Robotics
- Dynamic systems and control

Medical Engineering
With the MSE specialisation in Medical Engineering, you will be able to contribute to improving the quality of life of many patients. You will do this either by developing new medical devices or by improving existing applications.

**Subject areas:**
- Biomedical engineering
- Digital health systems
- Medical diagnostics and therapeutic systems
- Market access for medical devices

Photonics
Photonics makes possible numerous applications, making it an "enabler" of major cross-sectional technologies such as image processing and metrology, medical technology and life sciences, additive and subtractive manufacturing, communications and sensing. At the basis of all of these technologies are the generation, control, detection, and interaction of light.

**Subject areas:**
- Modern laser-based precision manufacturing
- Optical metrology and image processing
- Optoelectronics and electro optics
- Design and modelling of photonic systems
- Micro-technologies

International and mobility

You pursue your studies at SUPSI and you will have the opportunity to attend theory modules in Lausanne, Lugano or Zurich. These modules are taught by lecturers from all the Universities of Applied Sciences and attended by peers from the different regions of Switzerland.

You can also complete individual semesters abroad and participate in an international research project conducted by one of SUPSI academic partners.

MSE China Module
**Engineering Practice within Chinese and Swiss Culture**
The MSE China Module is organized by SUPSI and the University of Applied Science of Zurich (ZHAW). The course gives MSE students the opportunity to live a direct on-site experience of the Chinese industry, by showing the difficulties for the Swiss industry to enter the local market and by highlighting the possibilities to overcome those problems. The module also aims at bridging the cultural differences between MSE students and at facilitating their mutual cooperation.

The program is composed by seminars and visits to industrial companies in Switzerland, Shanghai, Suzhou, Changzhou, Guangzhou, Dongguan, Zhongshan, and Shenzhen for a total of 4 days spent in Switzerland and 2 weeks in China.
EIT Manufacturing Master’s programme
Since 2019, SUPSI is core partner of EIT Manufacturing, the Innovation Community within the European Institute of Innovation & Technology (EIT) that connects the leading manufacturing actors in Europe.
In 2020 the EITM network launched the EIT Manufacturing Master School, a Master programme jointly developed by SUPSI, Aalto University (Finland), Ecole Centrale de Nantes (France), Grenoble INP (France), Mondragon University (Spain), Politecnico di Milano (Italy), Technische Universität Wien (Austria), University College Dublin (Ireland) and University of Trento (Italy).
The EIT Manufacturing Master programme aims to attract top talents to further empower them through mobility and other learning opportunities to become leading innovators and entrepreneurs in manufacturing.

The EIT Manufacturing Double Degree Master programme allows students to:
- Study at two international universities: spend two semesters at SUPSI and two semesters at one of the partner universities
- Receive two diplomas, and an EIT Label Certificate
- Take part to industrial real case studies, testimonials, tours and internships at European level
- Create an international network: get in contact with academics, students, and professionals in different countries to broaden personal knowledge in different scientific areas
- Live a unique international and cultural experience
- Attend Innovation & Entrepreneurship courses (in particular the summer school)

What diploma can participants receive?
- 2 Master degrees (one for each of the two universities involved in the individual study path)
- An EIT Label Certificate

What are the requirements for the EIT Label Certificate?
Students will follow one of the 4 tracks (with international mobility):
1. People and Robots for Sustainable Work
2. Additive Manufacturing for Full Flexibility
3. Platforms for digitalized value Networks
4. Data Science and AI for competitive manufacturing

The Department of Innovative Technologies of SUPSI has over 180 ongoing research and development projects, many run jointly with local companies. DTI can count on more than 20 specialized technological laboratories.
“MSE Business Engineering students will develop multidisciplinary competences meant to address technical, process and organizational challenges both at the single company and at the supply network level. They will be able to integrate quantitative and qualitative methods in order to autonomously solving complex problems by combining a rigorous scientific method with the achievement of significant practical results, while appropriately managing all the processes involved in each specific project.”

“Today more than ever companies need the driving force that comes from the innovative vision of the new generations. The added value that the Master’s student brought to our team has fully achieved this goal and repaid our investment, helping us to go beyond the consolidated boundary of our routine through the freshness of a young approach, which is reinforced by the scientific rigor of an academic background.”

“The Master of Science in Engineering allows me to improve my theoretical basis without ignoring the professional aspect, which is a key to be competitive in today’s job market. I am a part time student and when I am not studying or working, I play ice hockey in the Lugano Ladies, a first division Swiss team. Thanks to the MSE structure and organization, I can follow my biggest passion and continue my studies.”

“The MSE was extremely enriching in many ways, such as the ideal mix of scientific study and interaction with the local economy, which allows you to improve your skills. The China module also allows the student to understand the importance of technological globalisation by giving the opportunity to live a direct and concrete experience. The part-time formula was optimal as it helped me to understand the synergies between study and work and to immediately apply the methodologies and techniques acquired during the academic courses.”
Thanks to its strong cooperation with local companies, SUPSI offers the opportunity to live a working experience with one of its industrial partners. Students also have the opportunity to work as an assistant at a DTI research institute and complete the MSE on a part-time basis, thus actively participating in research projects conducted within SUPSI research groups.

Some of our industrial partners:
- ABB Power Protection SA
- Agie Charmilles SA
- ALACAES SA
- Aptar Mezzovico SA
- ARGOR HERAEUS SA
- Cimotec SA
- CRYMS Sagl
- Exten SA
- FZSONICK SA
- GUESS Europe Sagl
- Jalib Switzerland manufacturing GmbH
- KerrHawe SA
- Linnea SA
- Lombardi SA Ingegneri Consulenti
- Mymarq
- Officine FFS SA
- RIRI SA
- RUAG AG
- Schindler SA
- Stagend SA
- Stelex Software Sagl
- Strisa Sviluppo Traffici Internazionali SA
- TE Connectivity Solutions GmbH
- Tri-star Electronics (Europe) SA
- Zambon Switzerland Ltd

Proficiency and profession
Students of the Master of Science in Engineering deepen their professional knowledge and ability in a targeted manner and have a broad basic training in their discipline. During their studies, they strengthen the ability to think abstractly and to act in a manner orientated towards applications and solutions. Graduates have a broad methodological know-how, and are able to recognize complex relationships and resolve tasks independently. The MSE prepares graduates for a position of responsibility in the fields of Technology and IT and Construction & Planning. Furthermore, holders of a Master are able to assume managerial duties and responsibilities for interdisciplinary projects.

 Tailor-made approach: design your individual study program
You will receive academic support from an advisor throughout your studies. Advisors are lecturers who assist you in individualizing your studies and in determining the contents of your subject specialization. Students draw up an individual study plan together with their appointed advisor. This plan is based on the student’s subject background and professional targets.

The individual study agreement sets out, firstly, the fundamental educational objectives, the subjects chosen for the individual Master’s course and the modules that will be attended. In addition, agreements are included on the specialisation projects (project aims, project partners, expected results in terms of subject and method, performance appraisal, etc.), the appropriate supplementary courses are defined, and details are provided of the private study expected.

Studying in the full-time or part-time model
The MSE offers both the full-study and part-time study curriculum. With full-time study, students will generally attend tuition for the theory modules on two days per week during the first and second semester, while investing the rest of the time in the technical specialisation. In the third semester, students then concentrate entirely on the Master’s thesis. The part-time study curriculum represents a unique opportunity for students who wish to combine the traditional study with a working experience in the industry.
Degree awarded
Upon successful completion of the Master’s degree course you will be awarded the degree Master of Science SUPSI in Engineering with specialisation in [name of profile]. The degree “Master of Science in Engineering (MSc)” is recognized by the Swiss authorities and internationally valid.

Admission steps and requirements
The MSE is targeted at the top 35% of bachelor’s graduates. Admission on a case-by-case basis is possible, but this must be discussed with the relevant University of Applied Sciences.

Tuition fee
The semester fee amounts to CHF 1600.–. This sum is reduced to CHF 800.– for students who benefit from the application of the ASUP Intercantonal Agreement for Vocational Universities (Swiss nationality or civil and fiscal domicile in Switzerland or in Liechtenstein). Specific agreements apply for students residing in Campione d’Italia. Contribution to didactic costs: CHF 150.– per semester. A CHF 100.– fee must be paid when the application is made. This fee is not reimbursable, and cannot be deducted from the semester fee.
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