

Future Mobility and Railway (FMR)

Master of Advanced Studies



Advanced Studies⁺
Continuing education

The knowledge, management and development of a sustainable and efficient mobility are key factors for corporate and industrial success.

Mobility is part of a multisectoral and interdisciplinary industry that regularly produces and brings to market new products and concepts. It is therefore implicit that new pioneering approaches are now required to meet the challenges of the future. For this reason, preparing the next generation of mobility experts has become crucial to a strong, stable, and sustainable economy.

As a holder of a Master in Future Mobility and Railway (FMR), you will be recognized as a specialist in the sector. You will have a proven ability to master the related topics and you will be given the necessary tools for further professional development.

The education programme aims to train and provide updates to professionals in the various fields of transport engineering and integrated mobility. With FMR, you will progress towards new dimensions: you will not only become a mobility manager, but rather a leader, an expert in the mobility of today and tomorrow.

FMR is a part-time programme that allows a balance between work, professional development and private life. The evolution of mobility, the social context and the development of new learning concepts have made it possible to build a course that combines in-person workshops, online lessons, and individual study moments.

Nothing happens until something moves.

- Albert Einstein

FMR, exploring future mobility.

Objectives

Students acquire the necessary skills for careers in departments such as research and development, production, consultancy, and public institutions and can take responsibility to lead teams, to strategize concepts, and to manage complex interdisciplinary projects.

- ♦ Create the concepts of integrated and future mobility
- ♦ Acquire the latest and future skills and competencies that are and will be required in the mobility sector
- ♦ Extend and deepen the knowledge of transportation and mobility systems
- ♦ Evaluate the relations between environment, society, economics, territory, innovation, and transportation
- ♦ Be familiar with the technical standards of the railway, mobility, and transportation system
- ♦ Evaluate and apply the latest technologies applicable to the mobility and railway sectors
- ♦ Immediately apply the new acquired competencies in the respective area

Prospects

The FMR Programme is devoted to managers, public servant, engineers and experienced employees from the mobility and transportation sectors, as well as to people interested to work in these sectors through the acquisition of the know-how provided by this course.

Requirements

- ♦ Bachelor's Degree in Engineering, Management, or other Technical and Scientific faculties.
- ♦ Non-graduates Professionals and Managers in the Mobility and Railway sectors must have at least 3 years of experience.
- ♦ Basics command of English is required.

Languages

The official Master's language is English (lessons and documentations). In agreement with the whole class, certain lessons can be held in Italian,

German or French. Project works for the respective CAS, as well as the final Master's thesis, can be written in English, German, Italian or French.

Certificate

Master of Advanced Studies SUPSI in Future Mobility and Railway (FMR). For each CAS a Certificate of Advanced Studies will be issued.

Didactic credits

60 ECTS for the MAS (and 15 ECTS for each CAS).

Admission steps

Online applications are accepted at any time. A minimum number of applicants for each CAS (7 Students) is required.

Trial periods

Students can enroll as auditors Free of Charge (FOC) for the first workshop sessions and the first three days of online lessons (week 1 and 2) of each CAS to evaluate whether they intend to follow the programme.

Course structure

The modules that make up each CAS take place in a block sequence and follow a mobility thematic thread. The course combines face-to-face lesson (workshops), online lessons and self-study moments. An introductory workshop and general thematic workshops will be offered at the beginning of each CAS. This will be followed by the thematic modules. These are developed according to a specific plan: they generally begin with online lessons alternating with individual study and conclude with a workshop. The respective CAS closes with an additional session of thematic workshops, exams, and the writing of the mini thesis.

Dates

The lectures schedule will be available onto the website fmr.moblab.swiss and on www.supsi.ch/fc. For the year 2022 the courses offered will be Advanced Mobility Systems (AMS) which starts on January 17, 2022, and Advanced Transportation Technologies (ATT) which is planned to start between June and August 2022. The Advanced Mobility Systems (AMS) and Advanced Transportation Infrastructure (ATI) CAS are expected to begin during 2023.

Online Platform

Online classes will be held using Moodle, the iCorsi platform and other online teaching dedicated software.

Some of the lessons might be pre-registered and can be accessed in advance. All lessons will be recorded and can be accessed by the students afterwards.

Locations

Workshop location will be disclosed 2 weeks in advance. It will be somewhere in Switzerland with easy access to public transportation. Other locations for lecture-related events will be communicated in a timely manner.

Tuition fee

Single CAS: CHF 6'800.-

Final project, Master Thesis: CHF 1'000.-

Entire MAS: CHF 17'500.- (+ CHF 1'000.-)

CAS and Module enrolment

It is possible to enrol for a single Certificate of Advanced Studies or, in exceptional cases, for a specific module.

Equivalence of other CAS

Applicants who, during another educational programme, have acquired expertise corresponding partially or totally to the learning objectives specified by the course, may benefit from equivalence, and may be granted a partial or total exoneration from some modules. A maximum

level of equivalence not exceeding 25% of the total number of ECTS is allowed for the qualification. Students can choose other related courses from another SUPSI continuing educational programme (max 25% of the total number of ECTS).

Head of the FMR MAS Programme

Antonio Bassi, Head of Continuing Education, SUPSI-DTI

Simone Bernasconi, Managing Director, MobLab

Advisory Board

Simone Bernasconi (MobLab)

Martin Bütikofer (Swiss Museum of Transport)

Luca Diviani (SUPSI)

Felix Hauri (independent consultant)

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Further information is available on the MAS FMR dedicated website fmr.moblab.swiss.

Contacts

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Programme

The course is divided into 4 specializations, each of which constitutes a Certificate of Advanced Studies (CAS). Students are required to complete 3 CAS and the Master Thesis to be awarded with the SUPSI MAS in Future Mobility and Railway (FMR).

Advanced Mobility Systems (AMS)

Students will learn about the latest trend technologies, how to innovate in a sustainable way, identify and adapt transportation systems to the needs of costumers and to the "new normal" society. This course will also contemplate the ultimate travel possibilities (autonomous drive) and a future mobility system analysis.

Modules:

- ♦ *Innovation & creativity*
- ♦ *Future mobility*
- ♦ *Future technologies*
- ♦ *Autonomous systems*
- ♦ *Mobility & environment*
- ♦ *Capacity analysis & planning*
- ♦ *Smart cities*

Advanced Transportation Technologies (ATT)

Attendees are going to study transportation engineering in a wide context with focus on rolling stock and railways systems. As railway engineering is the focus of this module, students will learn the most important concepts of vehicle design, traction, and control. They will be able to understand and manage technical information and understand how a vehicle is conceived, produced, tested, and put into operation. Furthermore, participants will be trained on maintenance and the importance of safety.

Modules:

- ♦ *Rolling stock introduction*
- ♦ *Mechanical systems*
- ♦ *Electrical & control and integration systems*
- ♦ *Traction system*
- ♦ *Selection & EIS*
- ♦ *Alternative transport systems*
- ♦ *Maintenance system*
- ♦ *Safety management*

Advanced Transportation Infrastructure (ATI)

You will learn the most important concepts of infrastructure designs, safety and security control systems and you will also be the first to use the Gotthard and the Ceneri base tunnels as educational tools. You will be able to understand and manage technical information and complex projects, as well as you will understand how an infrastructure project is conceived, designed, developed, tested, and put into operation. Furthermore, you will be confronted with the city infrastructure of the future and you will receive in-depth information on the operational side such as hubs and interchanges. This is a course in which smart infrastructure will be the central element: we will cover the impact of infrastructure on a variety of transportation systems.

Modules:

- ♦ *Introduction to infrastructure*
- ♦ *Advanced infrastructure*
- ♦ *Project management*
- ♦ *Interchanges & hubs*
- ♦ *Maintenance concepts*
- ♦ *Gotthard & Ceneri base tunnel case study*
- ♦ *Traffic control center*
- ♦ *Cities future infrastructure*

Advanced Mobility Management (AMM)

Students will learn about Mobility Management and Operations in a wide context. You will receive the most relevant notions of the regulatory framework, communication and information techniques, today's security challenges as well as capital investments. Additionally, you will work on the economical and marketing side of mobility, with a plus on visibility achievement and promotion. How operations are managed, or better, how shall be managed in the future will round-up this CAS.

Modules:

- ♦ *Transportation systems*
- ♦ *Strategy & regulations*
- ♦ *Asset management*
- ♦ *Information & communication*
- ♦ *Security & threats management*
- ♦ *Marketing, advertising & sales*
- ♦ *Operation management & simulation*

Further information

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