

University of Applied Sciences and Arts
of Southern Switzerland

SUPSI



competence centre
sustainable mobility and railways
innovation

Preliminary

Certificate of Advanced Studies SUPSI in Operation Management



An integrated approach for the
next generation of mobility professionals

With the support of



SBB CFF FFS

SWISSRAIL
Industry Association

The Certificate of Advanced Studies SUPSI in Operation Management (OMa)

OMa is part of the RSM MAS Program.

An investment of 7 extended weekends.

An efficient management and planning of public transportation is the key for a sustainable national development and business success.

Switzerland has been the most innovative country in the world since 2011 and it also has the best nationwide public transportation system: coordinated, efficient, on-time, clean and widely used. Due to its knowledge-based industry and economy it has the ability to apply efficiently innovative thinking into real projects.

How can we further improve our system? Can we learn from related sectors or from other countries? Can we expand our investment approach to other levels? It is possible by keeping and further developing the know-how and skills in the public transportation sector.

To maintain Switzerland's high standards, it is crucial to maintain the sector's leadership and continue being a worldwide reference.

With OMa the attendees will be able to make the shift to the next generation of public transportation.

RSM, exploring mobility.

CAS Operation Management

Code

RSM-OMA

Presentation

The focus of this CAS is to prepare the attendees to tackle the issues of transportation planning and management. It will address specific operational subject matters in both goods and passenger transport fields in the public and partially in the private sectors. This course will cover issues with an industry-minded approach covering topics such as intermodal passenger/goods transport, capacity planning, environmental impacts, and exchange hubs related to mobility and transportation.

This CAS is included into the MAS Railways and Sustainable Mobility (RSM). It trains both technical and management leaders, intended for careers in the transportation industry and in the public/private sectors of mobility & transportation. Participants will acquire the skills needed for careers in the following departments: research and development, production, consultancy and public institutions. They will be able to take responsibility for managing complex interdisciplinary projects.

The participants are going to study public transportation and planning in a wide context related to transportation. They will learn about the possible interconnection of different transport systems, how to efficiently design a public transportation system, how to calculate footprint emission of a system, about freight cooperation and interaction between road and rail and much more. This new course will allow the attendees to be at ease in every situation. It will not matter if the topic is related to the transport of person or freight, the participants will receive the knowledgeable and reliable counterpart.

Objectives

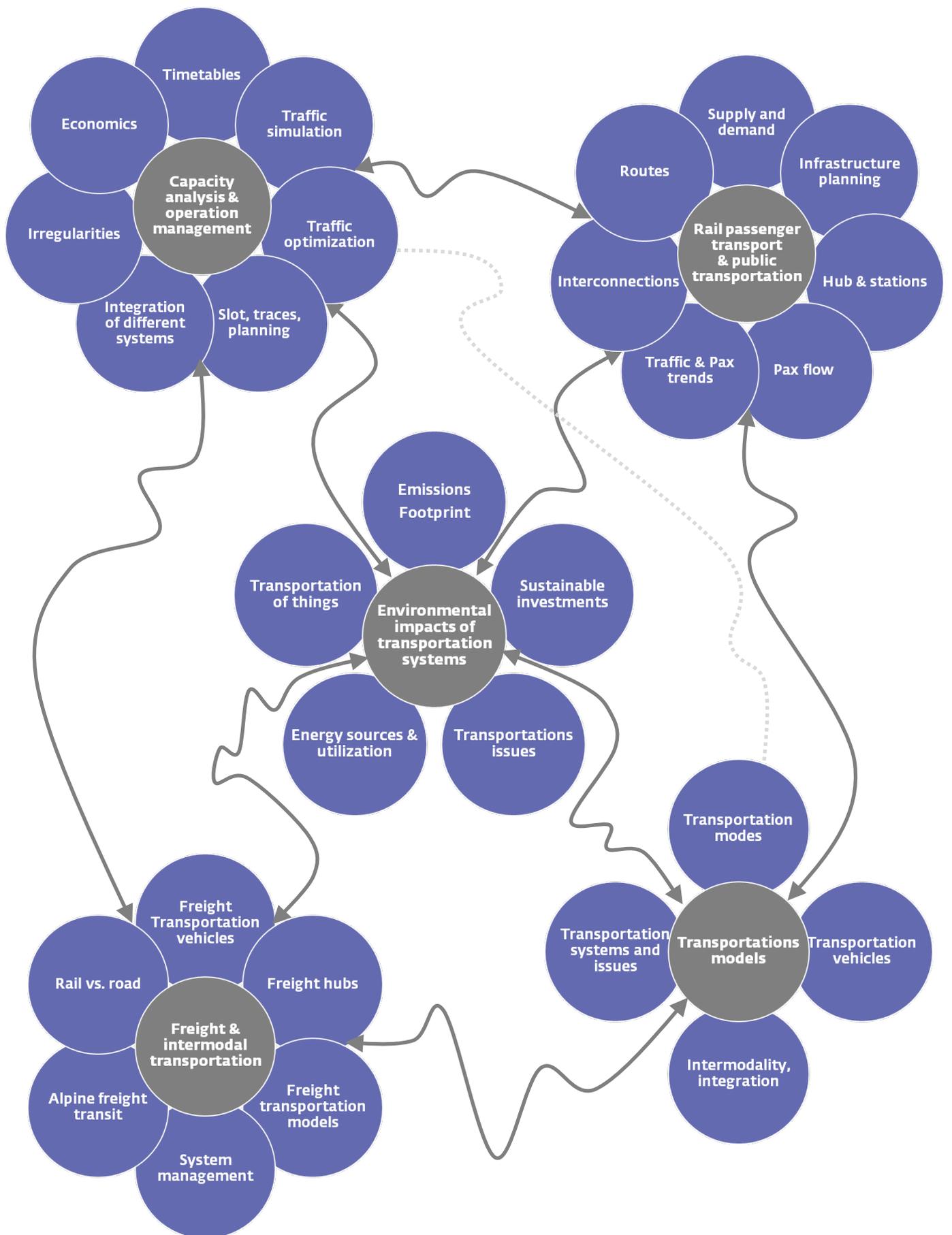
- › Understand the different transportation models and vehicles
- › Know, understand and correctly apply capacity analysis
- › Understand the environmental impacts of mobility and implement mitigating actions
- › Develop and put into effect new concept of environmentally friendly transportation
- › Know, understand and correctly apply principles of transportation operation management
- › Understand and use simulations tools
- › Describe a railways passenger transport system and understand the interdependencies
- › Describe and apply the general concept of freight & intermodal transportation
- › Know and understand the principles of urban public transportation

Intended Audience

This CAS is devoted to engineers, managers, entrepreneurs, and experienced employees from the mobility sector as well as to professionals interested to work in this sector through the acquisition of the knowhow provided by this course.

Training applications

- › Talent development training program
- › Internal employee re-qualification or certification
- › Introduction program for new hired staff
- › Experienced employee cross-qualification
- › Independent professional certification
- › Strategy development training



Practical relevance

The focus is on practice. In the OMa CAS the attendees will be actively involved in the huge challenges (demography, demand, services, ...) transportation is facing. The participants will be encouraged to bring their own examples and ideas to the discussion and will focus on innovative solutions and approaches on transportation problems issued from selected national (or international) operators. The attendants will then be able to make a seamless transition to the work world, being familiarized with the challenges in their different industry-based examples.

Skills

- > **Passenger urban transportation**
- > Understand and apply public transportation concepts, route design, and learn the different application of transportation vehicles and modes

- > **Simulate and understand the interactions**
- > Correctly define, understand and work with a simulation tool and understand the interdependencies

- > **Optimize schedules**
- > Identify and apply, based on passenger flows, capacity, demand and investment availability schedule improvements

- > **Protect the environment**
- > Understand and learn how to calculate the system footprint and improve the environmental impact of transportation (public and private)

- > **Intermodality**
- > Acquire all necessary skills on SCM and freight transport with a focus on intermodal systems

Requirements

Bachelor Graduates from Engineering Programs, Management or other Technical and Scientific faculties. Non-graduates Professionals and Manager from the fields Railways and Mobility with at least 3 years of experience. The Master is held in English (lessons and documentations) therefore a good command of English is required.

Certificate

Certificate of Advanced Studies SUPSI in Operation Management

Credits: 11 ECTS

Mandatory 1-day practical experience

Students shall choose one of the following experiences:

Train conductor - (Chef Kundenbegleiter, chef de train, capo treno)

Train driver - (Lokführer, conducteur de trains, macchinista)

Traffic engineer - (Verkehrssingenieur, ingénieur des transports, ingegnere del traffico)

Train controller - (Zugverkehrsleiter, chef circulation des trains, responsabile circolazione treni)

Client advisor - (Kundenberatung, conseiller clientèle, consulente della clientela)

Transport police - (Transportpolizei, police des transports, polizia dei trasporti)

Credits: no credits

Program

1	Module	Transportations models	TXM
	Lecturer	Giuliano Montanaro, CEO alius consulting Ltd.	
	Lessons	24 hours (2 ETCS)	
	Contents	<ul style="list-style-type: none">> Transportation modes: international; intercity; interregional; regional; metropolitan; urban; local; last-mile.> Transportation vehicles: “space”; aircraft; drone; vessel/ship; high-speed train; conventional train; metro; tram; bus; car; motorbike; bike; trolley; walking).> Intermodality: ship-train; train-car/bus/tram; aircraft-train/tram/bus; car-bike.> Transportation systems and issues: selection of means; travel demand; environmental issues; tourism/commuter/long-distance; economics development; system safety.	
2	Module	Rail passenger transport & public transportation	RPP
	Lecturer	SUPSI Lecturer and/or Industry Expert + Guest Lecturer	
	Lessons	24 hours (2 ETCS)	
	Contents	<ul style="list-style-type: none">> Supply & demand: over- and under-capacity, capacity adjustments> Pax flow: critical flow; security and safety issues; short-term adaptations.> Interconnections: coordination; commonalities; stations types; communication of information (ITCS & RBL)> Exchanges; hub & stations: transportation services, ancillary services;> Routes: transportation planning and development; route design, systems availability; investments and efficiency.> Traffic & Pax trends: forecasting (short-, mid-, long-term), identification of trends, adaptation of offer.> Infrastructure planning: demand and infrastructure; limits of infrastructure; planning framework; short-term solution; alternative solutions (cost efficient).	
3	Module:	Freight & intermodal transportation	FIT
	Lecturer	SUPSI Lecturer and/or Industry Expert	
	Lessons	24 hours (2 ETCS)	
	Contents	<ul style="list-style-type: none">> Freight transportation vehicles: road, rail, sea, air; characteristics; advantages and disadvantages> Freight hubs: logistic centers; transfer centers; territorial planning; infrastructure rationalization; transport quality; intermodality development.> Freight transportation models: modeling based on production, distribution, modal split, assignment.> System management: logistics management & coordination; SCM.> Alpine freight transit: examples of different North-South routes> Rail & road: differences; applications; competition; integration.	

Program (cont.)

4	Module	Capacity analysis & operation management	COM
	Lecturer	Giuliano Montanaro, CEO alius consulting Ltd.	
	Lessons	36 hours (3 ETCS)	
	Contents	<ul style="list-style-type: none">> Timetables: creation of timetable depending on demand, costs, service; stability in normal operation;> Traffic simulation: real examples of timetable creations/simulation; learn the basics of TRENOLab©> Traffic optimization: changes to schedule; impact on the overall system;> Slot & costs: availability; fares/charges.> Integration of different systems: conflicts of operations;> Irregularities: handling of irregularities; impact evaluation; timetable stability; prioritization.	
5	Module	Environmental impacts of transportation systems	EIT
	Lecturer	SUPSI Lecturer	
	Lessons	24 hours (2 ETCS)	
	Contents	<ul style="list-style-type: none">> Transportations issues: congestions; utilization; load factor; coordination; taxation.> Sustainable investment: development of renewable energy, efficiency, carbon emission offset control, public transport vs. individual motorized vehicles> Energy sources & utilization: electrical; renewable; fossil; fuel cell; nuclear.> Transportation of “things”: routes; time; frequency; load factor; reliability.> Emissions, Footprint: greenhouse gas emissions; recycling; optimization.	

Dates

Transportations models (TXM)

27 September 2019, 28 September 2019, 12 October 2019

Rail passenger transport & public transportation (RPP)

11 October 2019, 9 November 2019, 30 November 2019

Freight & intermodal transportation (FIT)

29 November 2019, 30 November 2019, 20 December 2019

Capacity analysis & operation management (COM)

26 October 2019, 22 November 2019, 23 November 2019, 21 December 2019

Environmental impacts of transportation systems (EIT)

25 October 2019, 8 November 2019, 21 November 2019

School Time

Friday 09:30 – 18:30 *

Saturday 09:00 – 18:00 *

* times might be adapted

Weekly block classes at company selected location available upon request (1 ON, 1, 2 or 3 OFF).

All RSM courses can be offered as a continuous 4 days for 4 weeks “Summer School” or “Block” class.

Method support

E-learning classes can be proposed by the lecturer (max 25%), skype attendance accepted (max. 25%)

Schedule

OMa				2019		2019		2019		2019		2019		2019			
				Sep 27	Sep 28	Oct 11	Oct 12	Oct 25	Oct 26	Nov 08	Nov 09	Nov 22	Nov 23	Nov 29	Nov 30	Dec 20	Dec 21
A	#	Start	Finish	Fri	Sat												
Operation Management	1	07:45	08:30														
	2	08:30	09:15		TXM		TXM										
	X	09:15	09:30														
	3	09:30	10:15		TXM	RPP	TXM	EIT	COM	EIT	RPP	COM	COM	FIT	FIT	FIT	EIT
	4	10:15	11:00		TXM	RPP	TXM	EIT	COM	EIT	RPP	COM	COM	FIT	FIT	FIT	EIT
	X	11:00	11:15														
	5	11:15	12:00		TXM	RPP	TXM	EIT	COM	EIT	RPP	COM	COM	FIT	FIT	FIT	EIT
	6	12:00	12:45		TXM	RPP	TXM	EIT	COM	EIT	RPP	COM	COM	FIT	FIT	FIT	EIT
	L	12:45	13:30														
	7	13:30	14:15		TXM	RPP	TXM	EIT	COM	EIT	RPP	COM	COM	FIT	RPP	FIT	COM
	8	14:15	15:00		TXM	RPP	TXM	EIT	COM	EIT	RPP	COM	COM	FIT	RPP	FIT	COM
	X	15:00	15:15														
	9	15:15	16:00		TXM	RPP	TXM	EIT	COM	EIT	RPP	COM	COM	FIT	RPP	FIT	COM
	10	16:00	16:45		TXM	RPP	TXM	EIT	COM	EIT	RPP	COM	COM	FIT	RPP	FIT	COM
X	16:45	17:00															
11	17:00	17:45	TXM	TXM	RPP	TXM	EIT	COM	EIT	RPP	COM	COM	FIT		FIT	COM	
12	17:45	18:30	TXM	TXM	RPP	TXM	EIT	COM	EIT	RPP	COM	COM	FIT		FIT	COM	
X	18:30	18:45															
13	18:45	19:30															
14	19:30	20:15															

Duration: 132 hour-lesson

Responsible: a.i. Luca Diviani

Enrolment

Until **September 20, 2019**. Applications/enrolments possible at any time previous agreement with the course responsible.

Place: At the “Officine FFS” in Bellinzona (5 minutes walking from the station).

Lectures

Tuition and documentation will be in English, but we can assist the students in Italian and German. If you wish to attend the course in another language, please mention it during registration and select between Italian and German. The Course could be held in another language if there were at least 8-10 participants.

Cost

CHF 6'100.-

For those who already have attended a CAS of the MAS – RSM, the cost is: CHF 5'700 with a further reduction of 10%. These costs include exam at the end of the form, issuing the certificate, and the documentation. Companies with more than 2 enrolled students will be granted a special discount.

In cooperation with

Swiss Federal Railways SBB and SWISSRAIL Industry Association

Information

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