

University of Applied Sciences and Arts  
of Southern Switzerland

**SUPSI**



competence centre  
sustainable mobility and railways  
innovation

**Preliminary**

# Certificate of Advanced Studies SUPSI in Integrated Technologies



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 Integrated Technologies (InTech)**

InTech is part of the RSM MAS Program.

An investment of 7 extended weekends.

Is your commuter train always on time? Is public transportation a safe way to travel? Are safety standards important in the operations of public transport? Are processes and procedures only drawings & checklists on paper? This course will open your eyes on topics that are usually hidden from newspapers headlines and are of most importance for a safe, reliable, and sustainable operation.

The industry sector is experiencing a disruptive phase and new technologies are entering all transportation segments changing the industrial production process. The understanding of new and unconventional approaches and alternative solutions is needed to address the maintenance and service problems of today.

Therefore, qualifying the next generation of leaders and technical experts for maintenance and integration is becoming one central aspect of a booming economy.

With InTech the attendees will be able to keep things running and will shape future transportation as reliable, sustainable and safe!

RSM, exploring mobility.

# CAS Integrated Technologies

## Code

RSM-IT

## Presentation

The focus of this CAS is preparing the students to tackle the issues of the transportation planning and management. It will address technical subjects related to maintenance, production and safety of the transportation sector. With an industry minded approach, this course, will cover topics such as process engineering, maintenance planning and changes, safety in technical activity and much more.

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 acquire the skills needed for careers in research and development, production, consultancy and public institutions departments and can take responsibility for managing complex interdisciplinary projects.

Attendees are going to study production and maintenance related to transportation in a wide context. Participants will learn about the latest technologies, how to prepare a maintenance plan, how to design a production process and implement it, how important is safety and use the required tools. This revolutionary course will allow the students to be at ease in every situation. You will be considered a knowledgeable and reliable counterpart.

## Objectives

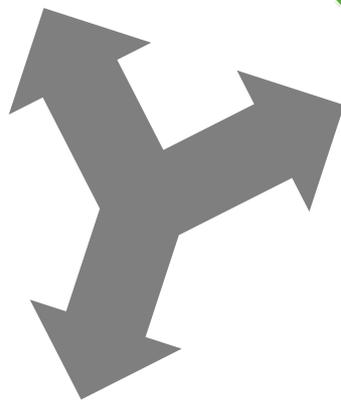
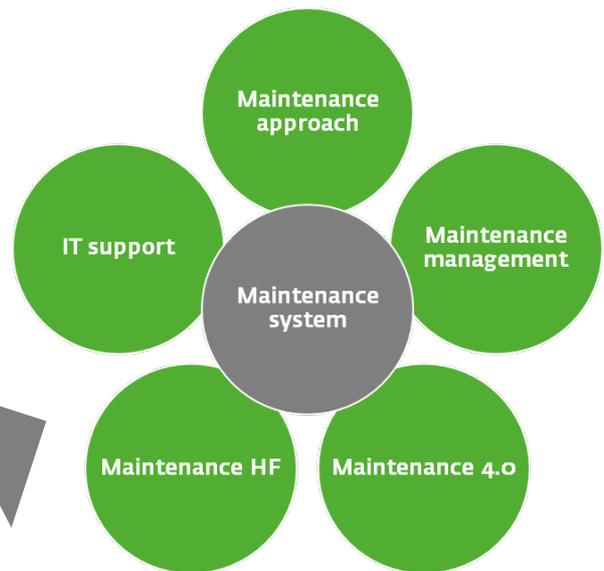
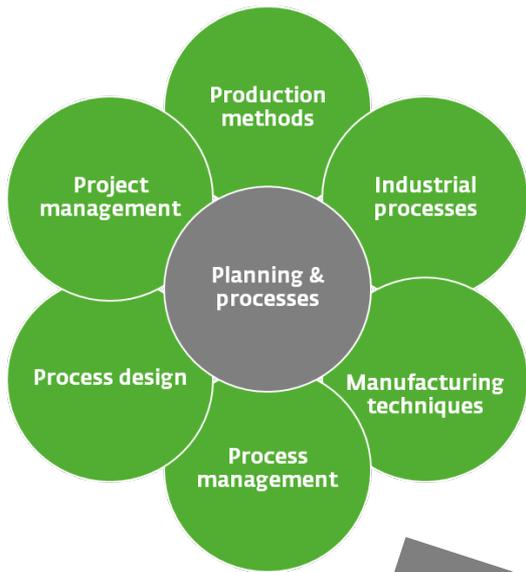
- › Understand the fundamentals and the basics of maintenance, processes, and safety
- › Know, understand and correctly apply safety standards & safety management
- › Understand, describe, and correctly apply human factor science and safety management
- › Develop maintenance concepts with entrepreneurship flair
- › Understand and apply (technical) integration techniques and implement an integration processes
- › Understand the impacts of changes and the correlated risks

## Intended Audience

This CAS is devised for 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 InTech CAS has a practical approach. The attendees will be actively involved in aspects of production, processes, maintenance and safety, being encouraged to bring their own examples and ideas to the discussion. The focus will be on innovative solutions and approaches on maintenance and production problems issued from selected manufacturer and national (or international) companies. They will then be able to make a seamless transition to the world of work, familiarized with the challenges stemming from the different industry-based examples.

## Skills

- > **Seamless integration**
- > Implement standard practices for system integration and apply integration concepts
  
- > **Structured approach**
- > Attendees will be able to design and review industrial processes, extract/create procedures and analyze their impact on your business.
  
- > **Safe operation**
- > All different aspects of safety will be at their fingertips allowing a seamless implementation.
  
- > **Keep it running!**
- > Prepare a maintenance concept to ensure effectiveness, safety and cost-control.
  
- > **Human Factor.**
- > Understand human limitation and practically apply HF to ensure safe operation

## Requirements

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

## Certificate

Certificate of Advanced Studies SUPSI in Integrated Technologies

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** - (Verkehringenieur, 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

<b>1</b>	<b>Module</b>	<b>Planning &amp; processes</b>	<b>PLP</b>
	<b>Lecturer</b>	Thomas Mertens, SBB	
	<b>Lessons</b>	48 hours (4 ETCS)	
	<b>Contents</b>	<ul style="list-style-type: none"><li>&gt; <b>Production methods:</b> Job production; batch production; flow production; lean production; interactions of methods.</li><li>&gt; <b>Industrial processes:</b> analysis; elements; design new plants; automation.</li><li>&gt; <b>Manufacturing techniques:</b> casting; imaging and coating; molding; forming; machining, joining; additive manufacturing.</li><li>&gt; <b>Process management:</b> Business process management (BPM) and business process reengineering; application of knowledge, skills, tools, techniques and systems to define, visualize, measure, control, report and improve processes</li><li>&gt; <b>Process design:</b> block flow; diagrams; specifications (In/Out); objectives and constraints.</li><li>&gt; <b>Project management:</b> basics of PM; The 4 P's of project management; approaches; process groups; tasks; risks; portfolios.</li></ul>	
<b>2</b>	<b>Module</b>	<b>Maintenance system</b>	<b>MXS</b>
	<b>Lecturer</b>	SUPSI Lecturer and/or Industry Expert	
	<b>Lessons</b>	48 hours (4 ETCS)	
	<b>Contents</b>	<ul style="list-style-type: none"><li>&gt; <b>Maintenance approach:</b> elements; scheduled; preventive; predictive.</li><li>&gt; <b>Maintenance management:</b> planning; interaction with OPS &amp; product; regulatory aspects; outsourcing; cost vs. services.</li><li>&gt; <b>Maintenance 4.0:</b> definition; applicability; methods &amp; tools; IT integration; changes.</li><li>&gt; <b>Maintenance HF:</b> skills; competencies; fatigue; behaviors.</li><li>&gt; <b>IT support:</b> controlling software, requirements.</li></ul>	
<b>3</b>	<b>Module:</b>	<b>Safety management</b>	<b>SAM</b>
	<b>Lecturer</b>	Simone Bernasconi, Managing Director msfi	
	<b>Lessons</b>	36 hours (3 ETCS)	
	<b>Contents</b>	<ul style="list-style-type: none"><li>&gt; <b>Risk, hazard assessment and mitigation:</b> perception of hazard &amp; risk; assessment methods; decision making; qualitative &amp; quantitative approaches.</li><li>&gt; <b>Safety elements:</b> development and implementation of SMS; SMS tools; safety strategies.</li><li>&gt; <b>Human factors:</b> Introduction to HF problems and methods; task analysis; error identification; situation awareness; fatigue; performance.</li><li>&gt; <b>Safety management manual:</b> elements and components of a SMSH; documentation management; implementation and distribution.</li><li>&gt; <b>Safety culture:</b> work methods, management systems, communications, Leadership; Responsibility; Accountability; Ethics.</li></ul>	

## Dates

### Planning & processes

26 July 2019, 27 July 2019, 10 August 2019, 20 September 2019, 21 September 2019

### Maintenance system

12 July 2019, 13 July 2019, 24 August 2019, 6 September 2019, 7 September 2019

### Safety management

9 August 2019, 23 August 2019, 20 September 2019, 27 September 2019

## School Time

Friday 09:30 – 18:30

Saturday 09:00 – 18:30

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

InTech				2019		2019		2019		2019		2019		2019		
				Jul 12	Jul 13	Jul 26	Jul 27	Aug 09	Aug 10	Aug 23	Aug 24	Sep 06	Sep 07	Sep 20	Sep 21	Sep 27
E	#	Start	Finish	Fri	Sat											
	1	07:45	08:30													
	2	08:30	09:15				PLP							PLP		
	X	09:15	09:30													
Integrated Technology	3	09:30	10:15	MXS	MXS	PLP	PLP	SAM	PLP	SAM	MXA	MXS	MXS	SAM	PLP	SAM
	4	10:15	11:00	MXS	MXS	PLP	PLP	SAM	PLP	SAM	MXA	MXS	MXS	SAM	PLP	SAM
		X	11:00	11:15												
	5	11:15	12:00	MXS	MXS	PLP	PLP	SAM	PLP	SAM	MXA	MXS	MXS	SAM	PLP	SAM
	6	12:00	12:45	MXS	MXS	PLP	PLP	SAM	PLP	SAM	MXA	MXS	MXS	SAM	PLP	SAM
		L	12:45	13:30												
	7	13:30	14:15	MXS	MXS	PLP	PLP	SAM	PLP	SAM	MXA	MXS	MXS	PLP	PLP	SAM
	8	14:15	15:00	MXS	MXS	PLP	PLP	SAM	PLP	SAM	MXA	MXS	MXS	PLP	PLP	SAM
		X	15:00	15:15												
	9	15:15	16:00	MXS	MXS	PLP	PLP	SAM	PLP	SAM	MXA	MXS	MXS	PLP	PLP	SAM
	10	16:00	16:45	MXS	MXS	PLP	PLP	SAM	PLP	SAM	MXA	MXS	MXS	PLP	PLP	SAM
		X	16:45	17:00												
	11	17:00	17:45	MXS	MXS	PLP	PLP	SAM	PLP	SAM	MXA	SAM	MXS	PLP	PLP	SAM
	12	17:45	18:30	MXS	MXS	PLP	PLP	SAM	PLP	SAM	MXA	SAM	MXS	PLP	PLP	SAM
	X	18:30	18:45													
13	18:45	19:30														
14	19:30	20:15														

**Duration:** 132 hour-lesson

**Responsible:** a.i. Simone Bernasconi

## **Enrolment**

Until **July 5, 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, 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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