

University of Applied Sciences and Arts
of Southern Switzerland

SUPSI



competence centre
sustainable mobility and railways
innovation

Certificate of Advanced Studies SUPSI in Railway Vehicles Technology



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 Railway Vehicles Technology (RVT)

RVT is part of the RSM MAS Program.

The transportation industry, especially the railway system, is undergoing a generational change.

Railways has been slowly evolving in the last decades and nowadays, the sector is strongly challenged by new competitors within the sector as well as from the outside. In countries where the railway transportation is carved in stone, transferring knowledge and building new skills are the foundations for business success.

Mobility services are continually adjusted to meet new customer needs. Travelers are changing habits and there is a new societal approach to transportation: it is imperative to have a wide-open approach to tackle the railways challenges of the next decades.

Therefore, preparing the next generation engineering and technical railways experts is key for a flourishing economy.

With RVT you evolve in a new railways system dimension: new engineering approach.

An investment of 7 extended weekends.

RSM, exploring mobility.

CAS Railway Vehicles Technology

Code

RSM-RVT

Introduction

Railway technology is undergoing a strong evolution and is reinvented day by day. The general objective of this CAS is to model highly skilled professionals in the railway vehicles field.

This CAS is a building block of the MAS Railways and Sustainable Mobility (RSM). It trains both technical and management leaders, seeking a career in the transportation industry and in the public/private sectors of mobility & transportation. Participants acquire the skills needed for careers in the research and development, production, consultancy and public institutions departments and to be capable of taking responsibility for managing complex interdisciplinary projects.

Attendees are going to study railways engineering in a wide context and learn the most important concepts of vehicle design, traction and control. They will be able to understand and manage technical information, complex projects and understand how a railway vehicle is conceived, specified, developed, produced, tested and put into operation. This technical course will allow participants to be comfortable in every situation. It will not matter if the topic is of mechanical, electrical or of IT nature, attendees will become a knowledgeable and reliable counterpart.

Objectives

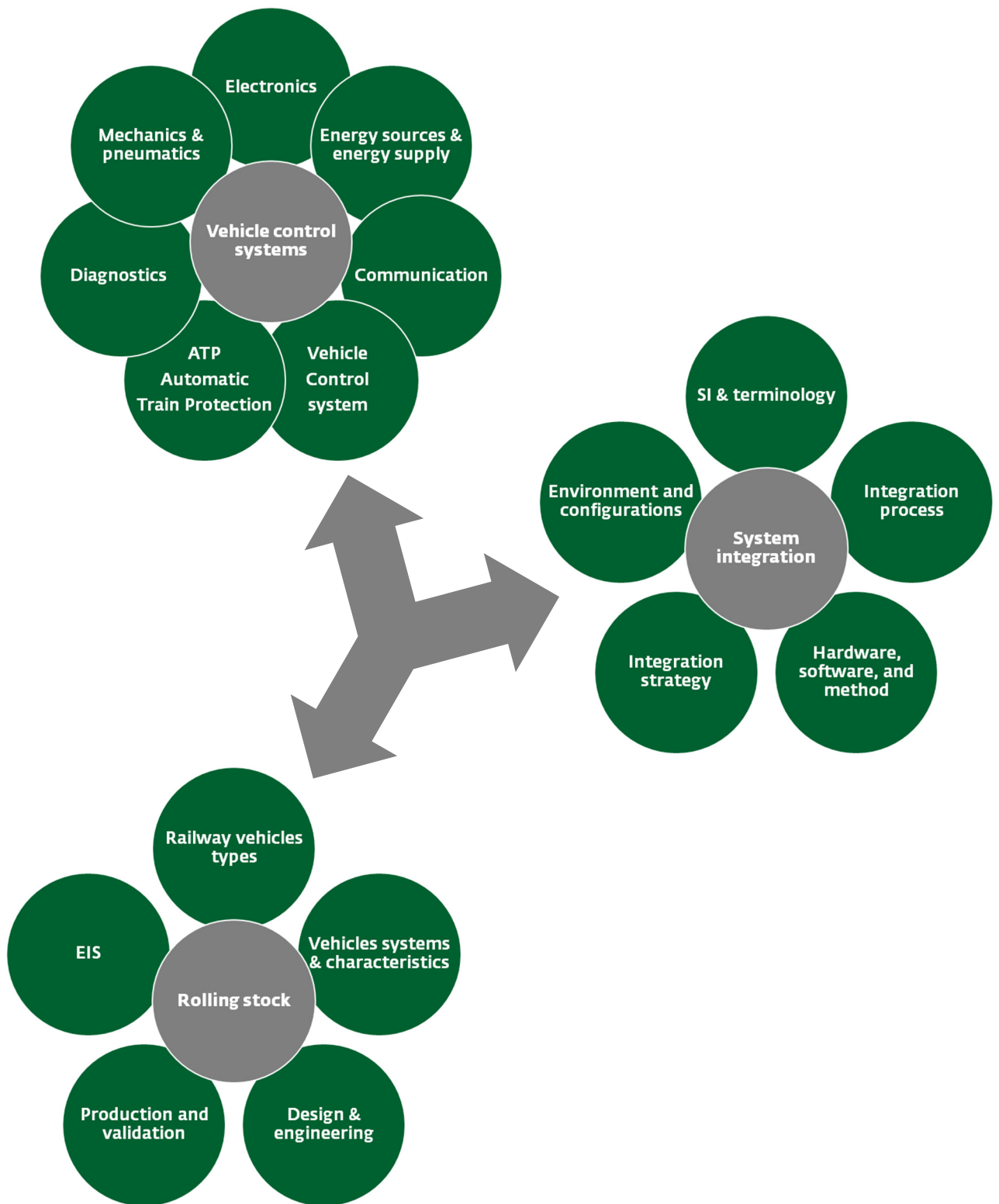
- › Train the future technical coordinators and project managers of the vehicle railways sector
- › Know, understand, and evaluate the different types of railway vehicles
- › Know and understand the technical characteristics of vehicles
- › Know, describe, and understand the interaction of the main elements of traction and vehicle control
- › Manage complex and interdisciplinary technical railway vehicles projects
- › Correctly apply the technical competencies (problem-solving, analysis, implementation)
- › Know, understand, and correctly use the terminology of the field
- › Understand and correctly utilize the regulatory framework

Intended Audience

This CAS is devised for managers, experienced employees and all professionals involved in the management in the railways and mobility sectors as well as to people interested to work in this department 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



Practical relevance

The RVT CAS has a practical approach. Attendees will be actively involved in the study of the technical aspects of rolling stock. They will be encouraged to bring their own examples and ideas to the discussion and debate actual railways system problems issued from selected manufacturer and national (or international) operators. Participants will then be able to activate a seamless transition to the world of work with the challenges stemming from different industry-based examples.

Skills

What are rail vehicles made of?

- › Understand the vehicles components, systems and characteristics

Ensure safe and efficient design for vehicles

- › Rail engineering design and planning know-how

Correctly organize a technical project

- › Suitable methods for preparing and managing a technical project within the specifications

The power and the controls

- › Technical and conceptual knowledge to understand the whole system

More than one industry provides vehicles

- › Understand and properly apply the integration process and strategy

Components management

- › Understand and define requirements of performance

Requirements

Bachelor Graduates from Engineering Programs, Management or other Technical and Scientific faculties. Non-graduates Professionals and Managers from the Railways and Mobility fields with at least 3 years of 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 Railways Vehicle Technology.
Credits: 11 ECTS

Mandatory 2-day practical experience

Students shall choose two of the following experiences:

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

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

Traffic engineer - (Verkehrsingenieur, 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)

AD Project Experience - (Autonomous Drive)

Vehicle hand-on - (Unterhalt und Service, entretien et service, manutenzione e servizio)

Credits: no credits

Program

1	Module	Rolling stock	ROS
	Lecturer	Daniele Fabbroni, Railway expert, Certiswiss and a Guest Lecturers	
	Lessons	60 hours (5 ETCS)	
	Contents	<ul style="list-style-type: none">> Railway vehicles: locomotive, wagon, multiple-unit trains, freight wagon.> Vehicles systems & characteristics: aerodynamics; bogie; brakes; pantographs; cabin; undercarriage; main structure; seats; information equipment; monitoring equipment.> Design & engineering: process, requirements, production, tests, validation.	
2	Module	Vehicle control system	TCS
	Lecturer	Daniele Fabbroni, Railway expert, Certiswiss and a Guest Lecturers	
	Lessons	36 hours (3 ETCS)	
	Contents	<ul style="list-style-type: none">> Power: Basics of power electronics, power train; power supply and auxiliary power supply; electrical/diesel engines; energy sources.> Control: communication systems; train control system; ATPs; system compatibility; diagnostics.> Technology: electronics; pneumatic system; mechanical systems.	
3	Module	System integration	SYI
	Lecturer	Daniele Fabbroni, Railway expert, Certiswiss and Guest Lecturers	
	Lessons	36 hours (3 ETCS)	
	Contents	<ul style="list-style-type: none">> SI & terminology: validation; verification; qualification; certification objectives; evidence; regulatory agencies and factory acceptance.> Integration process: phases process; top-down and bottom-up approaches; process and steps design.> Hardware, software, and method: components qualities; system qualities; failure modes and patterns; HW-SW integration.> Integration strategy: vertical, horizontal, star integration; fail early - risk reduction; static & dynamic behavior; products and components; robustness of integration.> Environment and configurations: test configurations; modeling; configuration management; change management; obsolescence.	

Dates

Rolling stock

30 November 2018, 1 December 2018, 21 December 2018, 18 January 2019, 19 January 2019, 15 February 2019

Traction & control systems

15 December 2018, 22 December 2018, 1 February 2019, 2 March 2019

System integration

14 December 2018, 2 February 2019, 16 February 2019, 2 March 2019

School Time

Friday 09:30 – 18:30

Saturday 09:30 – 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 15%), skype attendance accepted (max. 10%)

Schedule

RVT				2018		2018		2018		2019		2019		2019		2019	
D	#	Start	Finish	Nov 30 Fri	Dec 01 Sat	Dec 14 Fri	Dec 15 Sat	Dec 21 Fri	Dec 22 Sat	Jan 18 Fri	Jan 19 Sat	Feb 01 Fri	Feb 02 Sat	Feb 15 Fri	Feb 16 Sat	Mar 01 Fri	Mar 02 Sat
Railway Vehicles Technology	1	07:45	08:30														
	2	08:30	09:15										SYI		SYI		
	X	09:15	09:30														
	3	09:30	10:15	ROS	ROS	SYI	TCS	ROS	TCS	ROS	ROS	TCS	SYI	ROS	SYI		TCS
	4	10:15	11:00	ROS	ROS	SYI	TCS	ROS	TCS	ROS	ROS	TCS	SYI	ROS	SYI		TCS
	X	11:00	11:15														
	5	11:15	12:00	ROS	ROS	SYI	TCS	ROS	TCS	ROS	ROS	TCS	SYI	ROS	SYI		TCS
	6	12:00	12:45	ROS	ROS	SYI	TCS	ROS	TCS	ROS	ROS	TCS	SYI	ROS	SYI		TCS
	L	12:45	13:30														
	7	13:30	14:15	ROS	ROS	SYI	TCS	ROS	TCS	ROS	ROS	TCS	SYI	ROS	SYI		TCS
	8	14:15	15:00	ROS	ROS	SYI	TCS	ROS	TCS	ROS	ROS	TCS	SYI	ROS	SYI		TCS
	X	15:00	15:15														
	9	15:15	16:00	ROS	ROS	SYI	TCS	ROS	TCS	ROS	ROS	TCS	SYI	ROS	SYI		SYI
	10	16:00	16:45	ROS	ROS	SYI	TCS	ROS	TCS	ROS	ROS	TCS	SYI	ROS	SYI		SYI
	X	16:45	17:00														
	11	17:00	17:45	ROS	ROS	SYI	TCS	ROS	TCS	ROS	ROS	TCS	SYI	ROS	SYI		SYI
	12	17:45	18:30	ROS	ROS	SYI	TCS	ROS	TCS	ROS	ROS	TCS	SYI	ROS	SYI		SYI
	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 **November 23, 2018**. 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 three (3) enrolled participants will be granted a special discount.

In cooperation with

Swiss Federal Railways SBB and SWISSRAIL Industry Association

Information

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