SAPIENZA
UNIVERSITÀ DI ROMA

EDUCATIONAL ORGANIZATION

University Master of Second level in

Railway Infrastructure and Systems Engineering

1	**Academic year**	2025-2026
2	**Director**	Prof. Stefano Ricci
3	**Scientific Educational Council** [1]	Prof. Antonio D'Andrea Prof. Gaetano Fusco Prof. Guido Gentile Prof. Riccardo Licciardello Prof. Mara Lombardi Prof. Giuseppe Loprencipe Prof. Laura Moretti Prof. Quintilio Napoleoni Prof. Luca Persia Prof. Stefano Ricci Prof. Alessandro Ruvio
4	**Departmental activation resolution**	09/04/2025
5	**Starting date of lessons**	24/02/2026
6	**Teaching calendar** [2]	Monday to Friday, from 9:00 to 13.00 and from 14.00 to 18.00
7	**Partner organisations** [3]	• Almaviva • BPS Deployment • Ferrotramviaria Engineering • Generale Costruzioni Ferroviarie • ITALO – Nuovo Trasporto Viaggiatori • Salcef Group • Technital • Trenolab • •Other agreements currently being finalised
8	**Entry requirements** [4]	The Post-Master's course is open to holders of a degree completed under the old Italian university system (prior to Ministerial Decree 509/99), an Italian master's degree in the degree classes listed below, a second-cycle academic diploma or other equivalent qualification issued abroad recognised as suitable based on current regulations: Architettura e ingegneria edile-architettura (4/S, LM-4) Ingegneria aerospaziale e astronautica (25/S, LM-20) Ingegneria biomedica (26/S, LM-21) Ingegneria chimica (27/S, LM-22)

[1] Indicare i nominativi di tutti i docenti Sapienza titolari di attività formative menzionati nel Piano Formativo (minimo 5)
[2] Indicare giorni della settimana (esempio: venerdi-sabato, oppure un fine settimana al mese, etc) e (se noti) orari delle lezioni
[3] Le collaborazioni qui menzionate devono essere regolate da accordi perfezionati in Dipartimento.
[4] Indicare le classi di laurea cui appartengono i titoli richiesti per l'accesso al Master,

		Ingegneria civile (28/S, LM-23) Ingegneria dei sistemi edilizi (LM-24) Ingegneria dell'automazione (29/S, LM-25) Ingegneria della sicurezza (LM-26) Ingegneria delle telecomunicazioni (30/S, LM-27) Ingegneria elettrica (31/S, LM-28) Ingegneria elettronica (32/S, LM-29) Ingegneria energetica nucleare (33/S, LM-30) Ingegneria gestionale (34/S, LM-31) Ingegneria informatica (35/S, LM-32) Ingegneria meccanica (36/S, LM-33) Ingegneria navale (37/S, LM-34) Ingegneria per l'ambiente e il territorio (38/S, LM-35) Modellistica matematico-fisica per l'ingegneria (50/S, LM-44) Scienza e ingegneria dei materiali (61/S, LM-53)
9	**Selection test**	Thursday, 5 February 2026 - 8:30 am. The test will consist of: • a technical interview on knowledge of railway engineering • an aptitude interview aimed at assessing the cultural profile, motivation, practical and interpersonal skills of the candidates • an interview on knowledge of the English language
10	**Venue for teaching activities**	Rome
11	**Internship**	To be defined
12	**Teaching delivery modes**	In person. Midweek attendance.
13	**External financing, exemptions, concessions or reductions in fees** [5]	n.a.
14	**Secretariat Contacts** [6]	**Address** Via Eudossiana, 18 – 00184 Roma. RM031 - Edificio A Ingegneria c/o il Dipartimento di Ingegneria Civile, Edile e Ambientale – Area Trasporti **Phone** 0644585135 **e-mail** master_iisf@uniroma1.it

[5] Indicare esenzioni o riduzioni o finanziamenti disponibili, allegando eventuale lettera di intenti o documentazione pertinente (fatta salva la quota a bilancio di Ateneo del 30%)
[6] La Segreteria didattica deve essere collocata presso il Dipartimento di riferimento.

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Plan of Educational Activities

The Post-Master's programme will be taught in English.

Name of training activity	Learning goals	Lecturer[7]	Italian Disciplinary scientific area (SSD)	CFU (ECTS)	Type	Learning assessment (If applicable, and modality)
Teaching Module I: Principles of Railway Engineering	Provide learners with the basic elements necessary to effectively tackle the study of rail transport systems and integrated mobility, as well as the educational elements needed to understand the technical and economic characteristics and the dynamics of operation and interaction between transport system components.	Prof. Stefano Ricci	CEAR-03/B Trasporti	4	Lectures, Practical Classes, Seminars	Yes Oral
Teaching Module II: Track and Fixed Installations	Provide learners with knowledge of the components of railway superstructure, fixed installations for electric traction, signalling and telecommunications.	Prof. Stefano Ricci, Prof. Alessandro Ruvio	CEAR-03/B Trasporti (2 CFU), IIND-08/B Sistemi elettrici per l'energia (2 CFU)	4	Lectures, Practical Classes, Seminars	Yes Oral
Teaching Module III: Traction Systems and Vehicles Design	Provide learners with knowledge of traction systems on board railway vehicles, the laws governing their running dynamics, and the architecture and design principles of railway vehicles.	Prof. Riccardo Licciardello	CEAR-03/B Trasporti	4	Lectures, Practical Classes, Seminars	Yes Oral

[7] Inserire solo docenti Sapienza in servizio (no quiescenza, no anno sabbatico, no trasferimento). Per tutti gli altri inserire "docente da definire". Si ricorda che i docenti qui indicati devono corrispondere ai nominativi presenti nel CdS di cui al punto 3.

Teaching Module IV: Infrastructures Design	Provide learners with an overview of the design and construction aspects of railway infrastructure (railway layout, track geometry, substructure, tunnels and engineering structures, project documents, site preparation).	Prof. Giuseppe Loprencipe, Prof. Quintilio Napoleoni	CEAR-03/A Strade, ferrovie e aeroporti (2 CFU), CEAR-05/A Geotecnica (2 CFU)	4	Lectures, Practical Classes, Seminars	Yes Oral
Teaching Module V: Traffic Management and Control	Provide learners with knowledge of the principles and rules governing operation of railway and metro systems, the capacity of lines and junctions, signalling systems, and command and control equipment for operational safety.	Prof. Stefano Ricci	CEAR-03/B Trasporti	4	Lectures, Practical Classes, Seminars	Yes Oral
Teaching Module VI: Safety Management	Provide learners with knowledge of the theoretical principles of safety, risk analysis and its applications to transport infrastructure and systems; the role of the European Union Agency for Railways (ERA) and the National Safety Authorities (NSAs); and the safety management systems implemented by the various players in the rail transport sector.	Prof. Riccardo Licciardello, Prof. Mara Lombardi	CEAR-03/B Trasporti (2 CFU), CEAR-02/B Ingegneria e sicurezza degli scavi (2 CFU)	4	Lectures, Practical Classes, Seminars	Yes Oral
Teaching Module VII: Passenger and Freight Terminals	Provide learners with the theoretical principles of capacity underlying the design and planning of passenger and freight railway stations, also with reference to modal integration for mobility, with examples of recent new station construction projects and the redevelopment of existing stations.	Prof. Stefano Ricci	CEAR-03/B Trasporti	4	Lectures, Practical Classes, Seminars	Yes Oral
Teaching Module VIII: Freight Transport and Logistics	Provide learners with knowledge of the theoretical principles underlying logistics; freight transport techniques and regulations, with particular reference to rail and multimodal transport; information	Prof. Luca Persia	CEAR-03/B Trasporti	4	Lectures, Practical Classes, Seminars	Yes Written test

	systems supporting multimodal freight transport chains.					
Teaching Module IX: Service Planning and Quality	Provide learners with knowledge of the theoretical principles underlying transport system planning in general and railway planning in particular; service and timetable planning; quality logic and ICT systems, and their applications for mobility; operational management of railway traffic; transport cost assessment.	Prof. Gaetano Fusco, Prof. Guido Gentile	CEAR-03/B Trasporti	4	Lectures, Practical Classes, Seminars	Yes Oral
Teaching Module X: Planning and Construction of Urban Railways	Provide learners with knowledge of the main technical and regulatory aspects governing the planning, design and implementation of urban and suburban rail transport systems.	Prof. Antonio D'Andrea, Prof. Laura Moretti	CEAR-03/A Strade, ferrovie e aeroporti (2 CFU) CEAR-03/B Trasporti (2 CFU)	4	Lectures, Practical Classes, Seminars	Yes Oral
Teaching Module XI: Environmental Impacts Assessment	Provide learners with knowledge of the main technical and legislative aspects underlying the assessment of interventions and the environmental impact of railway systems, with reference to the entire life cycle: design, construction, operation and decommissioning.	Prof. Stefano Ricci	CEAR-03/B Trasporti	2	Lectures, Practical Classes, Seminars	Yes Oral
Teaching Module XII: Project Assessments ad Economy	Provide learners with basic knowledge of the economic and financial dynamics of a railway company and inform them about the fundamental non-technical skills required to work in companies operating in the railway sector.	Prof. Riccardo Licciardello	CEAR-03/B Trasporti	2	Lectures, Practical Classes, Seminars	Yes Oral
Teaching Module XIII: Exchange of internship experiences	Enable students to share their internship experiences by presenting the project developed during the internship.	Prof. Stefano Ricci	CEAR-03/B Trasporti	4	Oral presentations by students	No

Internship	Enable students to apply the knowledge acquired through classroom teaching to real cases in the working environment of companies operating in the rail transport and mobility sector.	SSD not required	6	*Host organisations: Railway companies, railway operators, railway undertakings, Post-Master's partners, research institutions.* *Locations: will be communicated directly to participants in good time for the internships to take place.*
Other Activities	-	SSD not required	-	-
Final learning assessment	Assess the knowledge and skills acquired by students during the Posy-Master's programme in the field of rail transport and mobility as a whole.	SSD not required	6	*Discussion of a final written dissertation (thesis) relating to internship activities and on a topic consistent with the aims of the course itself.*
TOTAL CFU (ECTS)			**60**	