ECOENGINE24

HIGHER TECHNICIAN FOR ADVANCED TECHNOLOGIES FOR RAIL TRANSPORTATION

https://www.itsprime.it/corsi-itsprime/ecoengine24/

The course is fully funded by PR Tuscany ESF+ 2021 - 2027, with D.D 13362 of 11/06/24 and is included in the framework of Giovanisì (www.giovanisi.it), the project of the Tuscany Region for the autonomy of young people.

Free for participants.

Participants who live more than 50 km away from the course location will receive **a contribution** to reimburse the expenses incurred for **food and accommodation**. The contribution will be granted only on condition that the participant successfully completes the ITS training course in which he/she is enrolled.

The ITS Prime Foundation has also provided for the award of **Scholarships** on the basis of merit and income. The terms and criteria for allocation and disbursement will be defined and communicated to students attending with appropriate notices and regulations.

Type of course:
Two-year course in higher education.

Teaching location:
the course will take place mainly at the ITS PRIME locations in **Pistoia, Via Cellini snc**. Some of the activities may be held in the technological laboratories of the Universities, Companies and Entities that collaborate with the ITS Prime Foundation. They may also be held occasionally in structures of educational or scientific interest located elsewhere. The internships may take place in companies located in any part of the regional, national and/or European territory.

Registration deadline: 11th October 2024, 11pm.

Type of final Diploma:
Diploma in " HIGHER TECHNICIAN FOR DESIGN AND ADVANCED MECHATRONIC PRODUCTION" (Ambito 6.1 - Sviluppo e innovazione del processo e del prodotto - Figura

6.1.1 dell'allegato 1 – DM 203 del 20.10.2023) with indication of specialization of the course in **"HIGHER TECHNICIAN FOR ADVANCED TECHNOLOGIES FOR RAIL TRANSPORTATION"** with the certification of the competences corresponding to the **European Qualifications Framework for lifelong learning (EQF) level 5** and constitutes a qualification for access to public competitions pursuant to Art. 5, paragraph 7, of the D.P.C.M 25 January 2008.

Entry requirements:
possession of secondary school diploma or after the 4-year Diploma of Vocational Education and Training (VET) integrated by a one-year Higher Technical Education and Training (IFTS) course;

age between 18 to 35 years old (not completed on the call deadline date);

basic skills in English and ICT.

Female candidates and/or candidates belonging to disadvantaged categories who have been successful in the selection process will be automatically admitted to participate in the course as trainees, up to the limit of the number of places allocated to them (50% of places to women, 7% to disadvantaged categories in accordance with the provisions of Law 68/1999).

Type of access:
classes can be made up of a **minimum number of 20 students** as required by current national regulations on the matter and a **maximum of 25 students**.

Selection mode
The selection of participants includes:
curricular evaluation by qualifications and experiences,
a written test,
a motivational interview.

Method of enrollment:
see link: https://www.itsprime.it/corsi-itsprime/ecoengine24/

Methods of recognition of previous training courses:
The student at the time of enrollment may request the recognition of training courses, formal or non-formal, producing the documentation that attests them. The request is submitted to the Scientific Technical Committee that evaluates the coherence of the previous training courses with the Training Units and the modules of the course that the student is going to attend. On this basis the Scientific Technical Committee indicates which modules

can be recognized as already learned by the student. Requests for recognition of training credits received after the selection date will not be evaluated.

Course Objectives.
The course "ECOENGINE24 - Higher Technician for Advanced Technologies for Rail Transportation" trains professionals specialized in railway maintenance using innovative digital technologies and eco-sustainable solutions to reduce the environmental impact of maintenance interventions. The skills acquired range from the ability to use advanced digital technologies for maintenance to understanding emerging market needs.

Main job opportunities
Railway maintenance technician
Specialist in digital technologies for maintenance
Environmental consultant

Didactic plan
The two-year course, of 2000 hours in total, takes place in 4 semesters with a didactic articulation that provides:
classroom lessons and laboratory activities (1200 hours),
internship, in Italy and abroad (800 hours). Any foreign internships are carried out with the European Erasmus+ programme.
Lesson time: Monday to Friday with a weekly commitment of 35-40 hours. Interruptions in teaching activities will be planned for holidays, summer and winter vacations.
The entire training course is carried out in close connection with the mechanic sector companies. The teaching team is composed of at least 70% of experts from the world of production, professions and work with a specific professional experience in the field. In particular is involved the staff of the companies, partners of ITS Prime Foundation.
Teachers from the School, University, Research Centres and Vocational Training will also be involved. Seminars, testimonies of key protagonists in the sector and visits to fairs, events, companies and installations of particular interest will complete the path of studies.

Possibility of access to further studies
The diploma may be integrated into a subsequent university course, with recognition of university credits (CFU) on the basis of the didactic regulations of the individual universities. In this regard, please refer to the regulations in force.

Regulations for the conduct of exams and other forms of school profit assessment
Each ITS PRIME course is biennial and consists of Training Units, divided into Didactic Modules.
At the end of each Didactic module, a 100-scale assessment is planned. For the modules with many hours of lessons, intermediate verifications are foreseen. Students, after having attended the course for at least 80% of the total hours of lessons, and having obtained in

all the Didactic modules at least 60/100, are admitted to the final exam. The exam consists of technical-practical tests and an interview.

Course structure
Training Units and Teaching Modules

UFC 1 - EMPOWERMENT E TEAM BUILDING

1.1 Outdoor Training (in ambiente esterno)
1.2 Laboratorio di Self Empowerment e Team Building
1.3 Problemsetting and solving - decision making - time management

UFC 2 - WORK AND BUSINESS ORIENTATION

2.1 The business and the employment relationship (contracts)
2.2 Company organization and organizational charts
2.3 Order management techniques
2.4 Supply Chain Management

UFC 3 - LANGUAGE SKILLS

3.1 English theory
3.2 English workshop
3.3 Technical English

UFC 4 - QUALITY, SAFETY AND ENVIRONMENT

4.1 Quality policies in the use of processes (ISO 9001)
4.2 Safety and prevention of accidents in the workplace
4.3 Ecological business; iso 14000 and eco-compatibility of industrial production

UFC 5 - ADVANCED TECHNOLOGIES FOR RAILWAY MAINTENANCE

5.1 Computer Aided Design
5.2 Parametric solid modeling
5.3 BIM (Building Information Modeling) and its connection with design
5.4 Rapid prototyping and reverse engineering
5.5 Virtual reality, augmented reality and simulation techniques
5.6 CBM (Condition Based Monitoring)
5.7 Remote measurements for civil works (integrated stations)

UFC 6 - INTRODUCTION TO THE RAILWAY SECTOR (IN ENGLISH)

6.1 Rolling stock and safety devices

6.2 Infrastructure and safety devices
6.3 Signaling and safety devices

UFC 7 - MECHANICAL DESIGN AND VALIDATION

7.1 Mechanical design and ecodesign principles
7.2 Numerical analyses and simulations for the project validation
7.3 Project documentation
7.4 From Project to Product
7.5 Validation of railway vehicles

UFC 8 - THE RAILWAY SYSTEM: VEHICLES

8.1 Types of rail vehicles
8.2 Architecture of railway vehicles
8.3 Constituent elements of railway vehicles
8.4 MV0 - General skills relating to the maintenance process (ANSFISA-recognised course)
8.5 MV1 - The running gear and related maintenance activities (ANSFISA-recognised course)
8.6 MV2 - The bogies and related maintenance activities (ANSFISA-recognised course)
8.7 MV3 - The pneumatic and brake system and related maintenance activities (ANSFISA-recognised course)
8.8 MV4 - The on-board technological system and related maintenance activities (ANSFISA-recognised course)
8.9 MV5 - The traction and repulsion devices and related maintenance activities (ANSFISA-recognised course)
8.10 MV6 - Electrical circuits and related maintenance activities (ANSFISA-recognized course)
8.11 MV7 - Doors and related maintenance activities (ANSFISA-recognized course)
8.12 MV8 - The chassis-body and related maintenance activities (ANSFISA-recognized course)
8.13 MV9 - The fire-prevention system and related maintenance activities (ANSFISA-recognized course)
8.14 Technology and maintenance of air conditioning and toilets
8.15 Maintenance, revamping and end-of-life management of the rolling stock system

UFC 9 - THE TRAIN SYSTEM: INFRASTRUCTURES AND CONTROL SYSTEMS

9.1 Infrastructure technology and maintenance: track and civil works

9.2 Infrastructure technology and maintenance: electric traction
9.3 Signalling technology and maintenance: Train Control System (SCMT), ERTMS, ATO
9.4 Security of public transport vehicles from external attacks: security and cybersecurity
9.5 Maintenance, revamping and end-of-life management of infrastructure and control systems
9.6 Laboratory

UFC 10 - INTERNSHIP

10.1 Internship in company

Timetable and credits for teaching modules

Acronym	ECOENGINE24						
Title	HIGHER TECHNICIAN FOR ADVANCED TECHNOLOGIES FOR RAIL TRANSPORTATION						
Modules Code	**Teaching**	**Hours Module**	**Hours UFC**	**Hours First year**	**HoursSecond year**	**Credits First year**	**Credits Second year**
	UFC 1 - EMPOWERMENT E TEAM BUILDING		**40**	First year		First year	
1.1	Outdoor Training (in ambiente esterno)	8		8		2	
1.2	Laboratorio di Self Empowerment e Team Building	16		16			
1.3	Problemsetting and solving - decision making - time management	16		16			
	UFC 2 - WORK AND BUSINESS ORIENTATION		**40**		Second year		Second year
2.1	The business and the employment relationship (contracts)	8			8		1
2.2	Company organization and organizational charts	12			12		2
2.3	Order management techniques	8			8		1
2.4	Supply Chain Management	12			12		2
	UFC 3 - LANGUAGE SKILLS		**70**	First year		First year	
3.1	English theory	40		40		2	
3.2	English workshop	20		20		1	
3.3	Technical English	10		10		1	
	UFC 4 - QUALITY, SAFETY AND ENVIRONMENT		**44**	First year		First year	
4.1	Quality policies in the use of processes (ISO 9001)	16		16		1	
4.2	Safety and prevention of accidents in the workplace	20		20		1	
4.3	Ecological business; iso 14000 and eco-compatibility of industrial production	8		8		1	
	UFC 5 - ADVANCED TECHNOLOGIES FOR RAILWAY		**240**	First year		First year	
5.1	Computer Aided Design	40		40		3	
5.2	Parametric solid modeling	80		80		4	
5.3	BIM (Building Information Modeling) and its connection with design	40		40		3	
5.4	Rapid prototyping and reverse engineering	24		24		2	
5.5	Virtual reality, augmented reality and simulation techniques	24		24		2	
5.6	CBM (Condition Based Monitoring)	16		16		1	
5.7	Remote measurements for civil works (integrated stations)	16		16		1	
	UFC 6 - INTRODUCTION TO THE RAILWAY SECTOR (IN ENGLISH)		**72**	First year		First year	
6.1	Rolling stock and safety devices	24		24		2	
6.2	Infrastructure and safety devices	24		24		2	
6.3	Signaling and safety devices	24		24		2	
	UFC 7 - MECHANICAL DESIGN AND VALIDATION		**114**	First year		First year	
7.1	Mechanical design and ecodesign principles	24		24		2	
7.2	Numerical analyses and simulations for the project validation	22		22		2	
7.3	Project documentation	20		20		1	
7.4	From Project to Product	24		24		2	
7.5	Validation of railway vehicles	24		24		2	
	UFC 8 - THE RAILWAY SYSTEM: VEHICLES		**296**	First year		First year	
8.1	Types of rail vehicles	24		24		2	
8.2	Architecture of railway vehicles	20		20		1	
8.3	Constituent elements of railway vehicles	32		32		2	
8.4	MV0 - General skills relating to the maintenance process (ANSFISA-recognised course)	16		16		1	
8.5	MV1 - The running gear and related maintenance activities (ANSFISA-recognised course)	16		16		1	
8.6	MV2 - The bogies and related maintenance activities (ANSFISA-recognised course)	16		16		1	
8.7	MV3 - The pneumatic and brake system and related maintenance activities (ANSFISA-recognised course)	16		16		1	
8.8	MV4 - The on-board technological system and related maintenance activities (ANSFISA-recognised course)	16		16		1	
8.9	MV5 - The traction and repulsion devices and related maintenance activities (ANSFISA-recognised course)	16		16		1	
8.10	MV6 - Electrical circuits and related maintenance activities (ANSFISA-recognized course)	24		24		2	
8.11	MV7 - Doors and related maintenance activities (ANSFISA-recognized course)	16		16		1	
8.12	MV8 - The chassis-body and related maintenance activities (ANSFISA-recognized course)	16		16		1	
8.13	MV9 - The fire-prevention system and related maintenance activities (ANSFISA-recognized course)	16		16		1	
8.14	Technology and maintenance of air conditioning and toilets	16		16		1	
8.15	Maintenance, revamping and end-of-life management of the rolling stock system	36		36		3	
	UFC 9 - THE TRAIN SYSTEM: INFRASTRUCTURES AND CONTROL SYSTEMS		**284**		Second year		Second year
9.1	Infrastructure technology and maintenance: track and civil works	40			40		4
9.2	Infrastructure technology and maintenance: electric traction	40			40		3
9.3	Signalling technology and maintenance: Train Control System (SCMT), ERTMS, ATO	40			40		3
9.4	Security of public transport vehicles from external attacks: security and cybersecurity	40			40		3
9.5	Maintenance, revamping and end-of-life management of infrastructure and control systems	40			40		4
9.6	Laboratory	84			84		4
	UFC 10 - INTERNSHIP		**800**		Second year		Second year
10.1	Internship in company	800			800		33
	TOTAL HOURS		**2000**	**876**	**1124**	**60**	**60**

ECTS credit system
For each course, ITS PRIME has adopted the calculation of credits according to the credit system used in the European Higher Education space ECTS (European Credit Tranfert Sy-stem). For the credits of an annuity there are, as for most Higher Education annuities, 60 credits. Typically 1 credit is equivalent to 25 hours of work between classroom (or laboratory for practical activities) and individual study . For each Didactic Module, the workload necessary for students to achieve the intended learning outcomes was assessed by assessment experts and module teachers. Lecture hours were considered 30% or 50% of the total workload hours according to the theoretical or theoretical-practical nature of the different modules. Time spent on company internship and laboratory activities was considered 100% of the workload.

Language of lessons
Italian

Course calendar
The course will start by October 30, 2024 and will end by October 2026. The actual start date of the course will be communicated via the ITS Prime Foundation website (www.itsprime.it).