

EUROPASS SUPPLEMENT TO THE CERTIFICATE OF THE HIGHER DEGREE SPECIALIZATION COURSE

NAME OF THE SPECIALIZATION COURSE

Specialization course in advanced maintenance of railway rolling stock systems

DESCRIPTION OF THE SPECIALIZATION COURSE

The holder has acquired the general competence relating to:

Organize, plan, supervise and execute the advanced maintenance of railway rolling stock systems, applying the current regulations, following the protocols of quality, safety, occupational risk prevention and environmental protection and respect.

Within this framework, each PROFESSIONAL MODULE includes the following LEARNING OUTCOMES acquired by the holder.

"Management and logistics of railway rolling stock maintenance".

The titleholder:

- Optimizes rail vehicle maintenance plans, applying scheduling techniques and establishing procedures for monitoring and control.
- Applies the phases of the maintenance process of railway vehicle elements, fulfilling the established quality and safety plans.
- Manages human resources for maintenance, coordinating work teams and determining actions for productivity improvement.
- Organizes the appearance and flow of spare parts and consumables, establishing their physical distribution, controlling inventories and using management models.
- Supervises corrective and preventive maintenance of railway rolling stock, verifying compliance with established protocols.
- Applies predictive maintenance techniques for railway rolling stock, using the following tools CBM (Condition Based Maintenance).
- Manages the treatment of waste generated in the maintenance and repair operations of railway vehicles, applying the current regulations for their treatment and recycling.
- Applies the rules of occupational risk prevention and personal safety, identifying risks and the measures and equipment to prevent them.

"On-board systems on rail vehicles".

The titleholder:

- Characterizes on-board systems in railway vehicles (signaling, train control and railway safety; telecommunications; standard train communication network TCN -Train Communication Network; image and sound; train safety), identifying the blocks and elements that form them.
- Verifies the operation of on-board systems on rail vehicles, interpreting their technical documentation, monitoring parameters and recognizing acceptance values.
- Identifies faults and malfunctions in on-board systems in railway vehicles, applying diagnostic and localization techniques.
- Supervises corrective and preventive maintenance techniques on on-board systems on rail vehicles, applying defined maintenance procedures.
- Commissions on-board systems on rail vehicles, integrating all the equipment, systems and subsystems.
- Verifies the operation of the air conditioning system of railway vehicles, identifying malfunctions.
- Verifies the operation of automatic door systems by applying repair procedures according to the type of faults detected.
- Applies the rules of occupational risk prevention, identifying the associated risks and the measures and equipment to prevent them.
- Applies environmental protection standards, identifying pollutants, describing the most appropriate effects on the environment and applying the regulations in force for their treatment.

"Railway electric traction".

The titleholder:

- Verifies the operation of direct current railway traction electric motors and electric generators by analyzing the characteristic parameters.
- Verifies the operation of alternating current, asynchronous and synchronous rail traction electric motors and alternators by analyzing the characteristic parameters.
- Diagnoses and locates faults and malfunctions in railway traction electric motors, generators and alternators, identifying the causes.
- Applies maintenance techniques for rail traction electric motors, generators and alternators, planning and performing operations in accordance with maintenance procedures defined.
- Verifies the operation of power converter elements, using diagnostic and troubleshooting techniques.
- Performs and supervises maintenance operations of electronic power converters applying defined maintenance protocols and procedures.
- Analyzes and verifies the operation of electrical energy collection railway equipment, checking parameters and identifying and remedying faults and malfunctions.
- Applies the rules of occupational risk prevention, identifying the associated risks and the measures and equipment to prevent them.
- Applies environmental protection standards, identifying pollutants, describing the effects on the environment and applying current regulations for their management.

"Railway thermal combustion engines".

The titleholder:

- Analyzes the operation of thermal combustion engines and auxiliary systems, recognizing construction parameters and the functionality of its elements.
- Evaluates the condition of the combustion thermal engine, identifying wear and deformations suffered in its elements and auxiliary systems.
- Diagnoses failures in thermal combustion engines and auxiliary systems, interpreting the indications or values of the operating parameters and analyzing the causes and effects of failures.
- Determines corrective and preventive maintenance techniques in thermal combustion engines and auxiliary systems, performing operations and interpreting maintenance plans.
- Applies the rules of occupational risk prevention, identifying the associated risks and the measures and equipment to prevent them.
- Applies environmental protection standards, identifying pollutants, describing the effects on the environment and applying current regulations for their treatment.

"Architecture of the bogie.

The titleholder:

- Defines the operability of the bogie structure and components, relating their functionality to the maintenance processes.
- Diagnose faults and malfunctions in the bogie elements and equipment, interpreting the indications and operating parameter values.
- Applies bogie maintenance and repair procedures, analyzing the causes and effects of the breakdowns encountered.
- Characterizes the elements of the traction and shock system, interpreting its technical characteristics and measuring parameters.
- Detects and corrects faults in the traction and shock system, defining and applying correction procedures.
- Applies the rules of occupational risk prevention, identifying the associated risks and measures and equipment to prevent them.
- Applies environmental protection standards, identifying pollutants, describing the effects on the environment and applying the current regulations for their treatment.

"Railway braking systems and auxiliary pneumatics".

The titleholder:

- Characterizes braking systems identifying equipment and elements and describing their functionality and operating parameters.
- Diagnoses and locates breakdowns and malfunctions in braking systems, relating the symptoms of dysfunction with the causes that produce them.
- Plans and performs maintenance operations of braking systems applying established techniques and protocols.
- Analyzes auxiliary pneumatic equipment and elements, describing their functionality, recognizing their characteristics and technical requirements.
- Diagnoses and corrects malfunctions in auxiliary pneumatic equipment, applying correction procedures.
- Applies the rules of occupational risk prevention, identifying the associated risks and measures and equipment to prevent them.
- Applies environmental protection standards, identifying pollutants, describing the effects on the environment and applying current regulations for their treatment.

"Workplace training".

The title

- Identifies the structure and organization of the company, relating them to the maintenance of railway rolling stock.
- Applies ethical and work habits in the development of his professional activity, in accordance with the characteristics of the job position and with the procedures established in the company.
- Diagnoses breakdowns of railway rolling stock by interpreting the indications or values of the operating parameters and analyzing the causes and effects of the breakdowns found.
- Determines corrective and preventive maintenance techniques for equipment and/or material system operations and interpreting plans.
- Supervises the performance of corrective and preventive maintenance of railway rolling stock.

JOBS THAT CAN BE PERFORMED WITH THIS SPECIALIZATION COURSE

The most relevant occupations and jobs are as follows:

- Technical Manager of the Railway Rolling Stock Maintenance Workshop.
- Equipment and Components Technician in the Rolling Stock Manufacturing and Railroad Maintenance Area
- Production Technician in the Railway Rolling Stock Manufacturing and Maintenance Area.
- Maintenance Technician of Industrial Installations in the Manufacturing Area Maintenance of Railway Rolling Stock.
- Technician in planning and programming of railway rolling stock maintenance processes.
- Team leader of railway rolling stock assemblers.
- Maintenance team leader of railway rolling stock maintenance workshops.
- Rolling Stock Supervisor.
- Assistant Technician.
- Rolling Stock Technician Specialist.
- Maintenance and Control Manager.
- Maintenance Operators.

CERTIFICATE ISSUANCE, ACCREDITATION AND LEVEL

Body issuing the certificate of the higher degree specialization course on behalf of the King: Ministry of Education and Vocational Training or the autonomous communities within the scope of their own competences. The certificate has academic and professional effects with validity throughout the State.

Official course duration: 360 hours.

Certificate level (national or international).

- NATIONAL: Non-university higher education.
- INTERNATIONAL:
 - Level P-5.5.4 of the International Standard Classification of Education (ISCED P-5.5.4).
 - Level 5C of the European Qualifications Framework (EQF 5C).

Access requirements:

To access the Specialization Course in Advanced Maintenance of Railway Rolling Stock Systems, it is necessary to hold one of the following degrees:

- a) Degree of Higher Technician in Development of Thermal and Fluids Installations Projects, established by Royal Decree 219/2008, of February 15, which establishes the degree of Higher Technician in Development of Thermal and Fluids Installations Projects and sets its minimum teaching requirements.
- b) Degree of Higher Technician in Maintenance of Thermal and Fluids Installations, established by Royal Decree 220/2008, of February 15, which establishes the degree of Higher Technician in Maintenance of Thermal and Fluids Installations and sets its minimum teaching requirements.
- c) Degree of Higher Automotive Technician established by Royal Decree 1796/2008, of November 3, 2008, which establishes the Degree of Higher Automotive Technician and sets its minimum education requirements.
- d) Title of Higher Technician in Industrial Mechatronics, established by Royal Decree 1576/2011, of November 4, which establishes the Title of Higher Technician in Industrial Mechatronics and sets its minimum teachings.
- e) Degree of Higher Technician in Electronic Maintenance, established by Royal Decree 1578/2011, of November 4, which establishes the Degree of Higher Technician in Electronic Maintenance and sets its minimum teaching requirements.
- f) Degree of Higher Technician in Automation and Industrial Robotics, established by Royal Decree. 1581/2011, of November 4, which establishes the Degree of Higher Technician in Automation and Industrial Robotics and sets its minimum teachings.

Legal Basis. The applicable regulation is Royal Decree 176/2021, of March 23rd, which establishes the specialization course in Advanced Maintenance of Railway Rolling Stock Systems and sets the basic aspects of the curriculum.

Explanatory note: This document is intended as additional information to the title in question, but has no legal validity whatsoever.

TRAINING OF THE OFFICIALLY RECOGNIZED SPECIALIZATION COURSE

PROFESSIONAL MODULES OF THE ROYAL DECREE OF THE HIGHER GRADE SPECIALIZATION COURSE	ECTS CREDITS
Management and logistics of railway rolling stock maintenance	5
On-board systems on rail vehicles	7
Railway electric traction	6
Railway thermal combustion engines	6
Architecture of the bogie	3
Railway braking systems and auxiliary pneumatics	6
Workplace training	6
	TOTAL CREDITS
	39
OFFICIAL DURATION OF THE SPECIALIZATION COURSE CERTIFICATE (HOURS)	360

* The minimum teaching of the specialization course reflected in the table above, 50%, are official and valid throughout the national territory. The remaining 50% belongs to each Autonomous Community and may be reflected in **Annex I** of this supplement.

INFORMATION ABOUT THE EDUCATION SYSTEM

