WP4. Design of training path

Analysis of the national training offer in Spain

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BuildOffsiteEU

Content

1 – Document synopsis

This document represents the initial step in WP4 "*Training path design*" whose main objectives are to know the training offer in each country and its adaptation to "new skills" demanded by the industrialised construction systems in line with the principles and objectives of EE&CE, to analyse common and differential characteristics of these offers to fill competence gaps (EQF levels 3-4-5) and to design a common framework for the training path and determine the elements to be included: contents, methodology, assessment, resources, trainer profile and so on.

More in details, purpose of this document is the analysis of the training offer in each country and its adaptation to the "new skills" demanded by the industrialised construction systems in line with the principles and objectives of EE&CE. Analyse common and differential characteristics of these offers to fill competence gaps (EQF levels 3-4-5).

The analysis has been conducted as a desk research and is addressed mainly to experts and skills-based performance appraisers, VET trainers in the construction sector and experts in design of training actions in the construction industry.

The analysis starts from the major findings of WP3 - "New Skills" Map elaboration by identifying the most relevant skills linked to the 4 targeted occupation: 1) Electrical installer, 2) HVAC engineering technician, 3) Roof labourer and 4) Building construction labourer.

The desk research has been implemented using the most relevant sources available in the country and the most updated research on the field, then has been sent to the selected experts via email as a basis for the feedbacks' interview. Purpose of the interviews has been the validation of key findings of the desk research and to complete any missing information on the current training offer in order to fill the identified skills gap.

2 – The BuildOffsiteEU New Skills Map

The “new skills” map aims to produce greater reach and impact among targets and beneficiaries, providing them with an updated, intuitive tool. The map is a proven information on competences and skills, and training needs of the “new workers” in the construction industry.

The “new skills” map is a matrix with 4 polygons. Each polygon, related to one of the four occupations, is divided into two parts, one part for the “crucial” and the other part for the “important” skills that need to be upgraded for industrialized construction, improving energy efficiency and circular economy.

	Electrical installer	HVAC engineering technician	Roof labourer	Building construction labourer
CRUCIAL				
IMPORTANT				
NOT CRUCIAL				

Electrical installer	HVAC engineering technician	Roof labourer	Building construction labourer
Use BIM models	Interpret 2D and 3D digital plans	Interpret 2D and 3D digital plans	Interpret 2D and 3D digital plans
Install smart devices	Install and maintain home automation systems	Establish green roof	Work ergonomically
Interpret 2D and 3D digital plans	Lead a team perform maintenance on installed equipment	Program a CNC controller	Interpret plans for modular construction
Install automation components	Install geothermal heat pump	Prepare the roof for solar system (PV and solar thermal system)	Sort waste and demolition materials
Calculate solar panel orientation	Ensure compliance with environmental legislation	Follow safety procedures when working at heights	Recognize impact of materials lifetime for maintenance and demolition
Mount photovoltaic panels	Drain hazardous liquids	Assess conservation needs	Calculate needs for construction supplies
Use diagnostic tools for electronic repairs	Monitor utility equipment and use testing equipment	Sort waste and demolition materials	Follow safety procedures when working at heights
Follow health and safety procedures in construction and working at heights	Apply health and safety standards	Inspect construction supplies and calculate needs for construction supplies	Prepare the envelope for PV walls
Assemble sensors	Advise on fitted ventilation systems	Follow health and safety procedures in construction	Install connections of modular building elements

Assemble electrical and mechatronic components and units	Resolve equipment malfunctions	Install connections of modular roof elements	Use building materials and components reuse
Work in a construction team	Arrange equipment repairs	Install lightning protection system	Follow health and safety procedures in construction
Calculate needs for construction supplies	Install heating pump	Use measurement instruments	Inspect construction supplies and calculate needs for construction supplies
Check compatibility of materials	Handle refrigerant transfer pumps	Apply restoration techniques	Use measurement instruments
Write inspection reports	Perform refrigerant leak checks	Construct roof structure with construction profiles	Apply restoration techniques
Use precision tools	Install heating, ventilation, air conditioning and refrigeration ducts	Recognize construction and isolation materials	Recognize dry construction methods
Test and resolve equipment malfunctions	Handle refrigerant transfer pumps	Install insulation material and roll roofing	Install insulation material on floor and walls
Install inverters	Perform refrigerant leak checks	Install roof windows	Recognize construction and insulation materials
Measure electrical characteristics	Install heating, ventilation, air conditioning and refrigeration ducts	Lay roof with materials for roofing like clay tile, asphalt composite shingles, built-up roofing and rolled roofing	Install windows
Provide power connection from bus bars	Conduct routine machinery checks	Build scaffolding	Install construction profiles and different kind of bricks
Replace defect components	Install refrigeration equipment	Operate tolls for cutting materials	Prepare fasade cladding
Install wiring, lightning, and protection system	Install ventilation equipment	inspect roofs install guttering	Work on demolition processes
Repair wiring	Install heating furnace	Lay roof tiles	Work with mortar and concrete
Use measurement instruments	Lay pipe installation		
Work under voltage	Install air conditioning device		
Install electric switch boxes	Install electrical and electronic equipment		
Install electrical household appliances	Install heating boiler		

3 – Matching the Map with the national offer

Occupation	Required skills	Training available YES/NO	Title	Duration hours	Brief description
Electrical installer	Use BIM models	NO			
	Install smart devices	YES	Electrical installation and commissioning of solar photovoltaic systems	60	- Qualification level 1. Professional family Energy and water. Professional field Renewable energies
			Electrical and automatic installations technician	2000	- Intermediate Vocational Training. Regulated education of the Ministry of Education
			Aerothermal and photovoltaic: Integrated renewable energies	250	- Qualification level 2. Professional family Installation and maintenance. Professional area Assembly and maintenance of installations
	Interpret 2D and 3D digital plans	YES	Interpretation of plans	20	- Qualification level 2. Professional family Building and civil works. Professional area Projects and monitoring of works
	Install automation components	YES	Installation and maintenance of photovoltaic solar energy installations	50	- Qualification level 2. Professional family Energy and water. Professional field Renewable energies
			Aerothermal and photovoltaic: Integrated renewable energies	250	- Qualification level 2. Professional family Installation and maintenance. Professional area Assembly and maintenance of installations
	Calculate solar panel orientation	YES	Construction of solar photovoltaic pergolas	104	- Qualification level 2. Professional family Building and civil works.

					Professional area Bricklaying and finishing Works
			Electrical installation and commissioning of solar photovoltaic systems	60	- Qualification level 1. Professional family Energy and water. Professional field Renewable energies
			Installation and maintenance of photovoltaic solar energy installations	50	- Qualification level 2. Professional family Energy and water. Professional field Renewable energies
			Photovoltaic solar energy for self-consumption. Level I	30	- Qualification level 2. Professional family Energy and water. Professional field Renewable energies
			Photovoltaic solar energy for self-consumption. Level II	30	- Qualification level 2. Professional family Energy and water. Professional field Renewable energies
	Mount photovoltaic panels	YES	Construction of solar photovoltaic pergolas	104	- Qualification level 2. Professional family Building and civil works. Professional area Bricklaying and finishing Works
			Electrical installation and commissioning of solar photovoltaic systems	60	- Qualification level 1. Professional family Energy and water. Professional field Renewable energies
			Installation and maintenance of photovoltaic solar energy installations	50	- Qualification level 2. Professional family Energy and water. Professional field Renewable energies
			Auxiliary operations in photovoltaic solar installations. Assembly	60	- Training action of the Fundación Laboral. State Training Plan 2023, qualification, and requalification.

			Auxiliary operations in solar thermal installations. Maintenance	30	- Training action of the Fundación Laboral. State Training Plan 2023, qualification, and requalification.
			Auxiliary operations in photovoltaic solar installations. Maintenance	30	- Training action of the Fundación Laboral. State Training Plan 2023, qualification, and requalification.
			Photovoltaic solar energy for self-consumption. Level I	30	- Qualification level 2. Professional family Energy and water. Professional field Renewable energies
			Photovoltaic solar energy for self-consumption. Level II	30	- Qualification level 2. Professional family Energy and water. Professional field Renewable energies
	Use diagnostic tools for electronic repairs	YES	Installation and maintenance of photovoltaic solar energy installations	50	- Qualification level 2. Professional family Energy and water. Professional field Renewable energies
			Aerothermal and photovoltaic: Integrated renewable energies	250	- Qualification level 2. Professional family Installation and maintenance. Professional area Assembly and maintenance of installations
	Follow health and safety procedures in construction and working at heights	YES	Prevention of Occupational Risks in electrical work	20	- Qualification level 1. Professional family Building and civil engineering. Professional area Installation and assembly
			Prevention of Occupational Risks in electrical work. Specific part	6	
	Assemble sensors	YES	Aerothermal and photovoltaic: Integrated renewable energies	250	- Qualification level 2. Professional family Installation and maintenance. Professional area Assembly and maintenance of installations
	Assemble electrical and mechatronic components and units	YES	Electrical and automatic installations technician	2000	- Intermediate Vocational Training. Regulated education of the Ministry of Education

			Installation and maintenance of photovoltaic solar energy installations Aerothermal and photovoltaic: Integrated renewable energies	50 250	- Qualification level 2. Professional family Energy and water. Professional field Renewable energies - Qualification level 2. Professional family Installation and maintenance. Professional area Assembly and maintenance of installations
HVAC engineering technician	Interpret 2D and 3D digital plans	YES	Interpretation of plans Design of geothermal or aerothermal systems	20 130	- Qualification level 2. Professional family Building and civil works. Professional area Bricklaying and finishing Works - Qualification level 3. Professional family Building and civil engineering. Professional area Installation and assembly
	Install and maintain home automation systems	YES	Home automation Manage services in the IT system Installing infrastructure in home and building automation systems Maintain home and building automation system infrastructure Implement and maintain equipment and devices in home and building automation systems	60 90 210 120 120	- Qualification level 2. Professional family Building and civil works. Professional area Projects and monitoring of Works Part of the qualification Implementation and maintenance of domotic, inmotic, access control, presence, and video surveillance systems (Electricity and electronics professional family)

	Lead a team perform maintenance on installed equipment	NO			
	Install geothermal heat pump	YES	Design and optimisation of underfloor heating for efficient climate control	130	- Qualification level 3. Professional family Building and civil engineering. Professional area Installation and assembly
			Design of geothermal or aerothermal systems	50	- Qualification level 3. Professional family Energy and water. Professional field Renewable energies
			Installation and maintenance of geothermal and solar energy installations applied to air conditioning	50	- Qualification level 2. Professional family Installation and maintenance. Professional area Refrigeration and air conditioning
	Ensure compliance with environmental legislation	YES	Design and optimisation of underfloor heating for efficient climate control	130	- Qualification level 3. Professional family Building and civil engineering Professional area Installation and assembly
			Quality and environment in construction 4.0	80	- Qualification level 3. Professional family Building and civil works. Professional area Projects and monitoring of works
Roof labourer	Interpret 2D and 3D digital plans	YES	Installation of lightweight prefabricated panels for industrialised building envelopes	40	- Qualification level 2. Professional family Building and civil works. Professional area Bricklaying and finishing Works
			Interpretation of plans	20	- Qualification level 2. Professional family Building and civil works.

					Professional area Projects and monitoring of works
	Establish green roof	YES	Installation and maintenance of energy efficient green roof systems	150	- Qualification level 2. Professional family Building and civil engineering. Professional area Installation and assembly
			Introduction to green roofs and their impact on energy efficiency	70	- Qualification level 1. Professional family Energy and water. Professional area Energy efficiency
			Basic procedures in green roof installation	200	- Qualification level 1. Professional family Building and civil engineering. Professional area Installation and assembly
	Program a CNC controller	NO			
	Prepare the roof for solar system (PV and solar thermal system)	NO			
	Follow safety procedures when working at heights	YES	Installation and maintenance of energy efficient green roof systems	150	- Qualification level 2. Professional family Building and civil engineering. Professional area Installation and assembly
			Basic procedures in green roof installation	200	- Qualification level 1. Professional family Building and civil engineering. Professional area Installation and assembly
			Safety and techniques for working at heights	40	- Qualification level 2. Professional family Safety and environment. Professional area Safety and prevention

			Safety in temporary work at height: essential requirements, equipment and techniques	8	Training action of the Fundación Laboral. Initiation
	Assess conservation needs	YES	Installation and maintenance of energy efficient green roof systems	150	- Qualification level 2. Professional family Building and civil engineering. Professional area Installation and assembly
			Basic procedures in green roof installation	200	- Qualification level 1. Professional family Building and civil engineering. Professional area Installation and assembly
	Sort waste and demolition materials	NO			
	Inspect construction supplies and calculate needs for construction supplies	YES	Installation of lightweight prefabricated panels for industrialised building envelopes	40	- Qualification level 2. Professional family Building and civil works. Professional area Bricklaying and finishing Works
			Installation and maintenance of energy efficient green roof systems	150	- Qualification level 2. Professional family Building and civil engineering. Professional area Installation and assembly
			Introduction to green roofs and their impact on energy efficiency	70	- Qualification level 1. Professional family Energy and water. Professional area Energy efficiency
			Basic procedures in green roof installation	200	- Qualification level 1. Professional family Building and civil engineering. Professional area Installation and assembly
			Basic participatory dry construction operations	330	- Qualification level 2. Professional family Building and civil engineering.

					Professional area Installation and assembly
	Follow health and safety procedures in construction	YES	Installation of lightweight prefabricated panels for industrialised building envelopes	40	- Qualification level 2. Professional family Building and civil works. Professional area Bricklaying and finishing Works
			Basic procedures in green roof installation	200	- Qualification level 1. Professional family Building and civil engineering. Professional area Installation and assembly
			Prevention of Occupational Risks for the laying of roofing materials	20	- Qualification level 1. Professional family Building and civil works. Professional area Bricklaying and finishing Works
			Prevention of Occupational Risks for the laying of roofing materials. Specific part	6	- Qualification level 1. Professional family Building and civil works. Professional area Bricklaying and finishing Works
Building Construction labourer	Interpret 2D and 3D digital plans	YES	Fundamentals of masonry work for construction 4.0	35	- Qualification level 1. Professional family Building and civil works. Professional area Bricklaying and finishing Works
	Work ergonomically	YES	Basic procedures for efficient curtain wall installation	110	- Qualification level 1. Professional family Building and civil engineering. Professional area Installation and assembly
			Prevention of Occupational Risks for masonry works	20	- Qualification level 1. Professional family Building and civil works. Professional area Bricklaying and finishing Works

			Prevention of Occupational Risks for masonry works. Specific part	6	- Qualification level 1. Professional family Building and civil works. Professional area Bricklaying and finishing Works
	Interpret plans for modular construction	YES	Fundamentals of masonry work for construction 4.0 Installation of lightweight prefabricated panels for industrialised building envelopes	35 40	- Qualification level 1. Professional family Building and civil works. Professional area Bricklaying and finishing Works - Qualification level 2. Professional family Building and civil works. Professional area Bricklaying and finishing Works
	Sort waste and demolition materials	NO			
	Recognize impact of materials lifetime for maintenance and demolition	YES	New sustainable building materials	20	- Qualification level 1. Professional family Building and civil works. Professional area Bricklaying and finishing Works
	Calculate needs for construction supplies	YES	Installation of lightweight prefabricated panels for industrialised building envelopes	40	- Qualification level 2. Professional family Building and civil works. Professional area Bricklaying and finishing Works
	Follow safety procedures when working at heights	YES	Safety in temporary work at height: essential requirements, equipment and techniques	8	Training action of the Fundación Laboral. Initiation
	Prepare the envelope for PV walls	YES	Basic procedures for efficient curtain wall installation	110	- Qualification level 1. Professional family Building and civil engineering. Professional area Installation and assembly

	Install connections of modular building elements	YES	Installation of lightweight prefabricated panels for industrialised building envelopes Precast concrete fitter	40 60	- Qualification level 2. Professional family Building and civil works. Professional area Bricklaying and finishing Works Training action of the Fundación Laboral. Initiation

4 - Conclusions

The training offer presented here to cover the skills gaps of the four selected profiles (Electrical installer, HVAC engineering technician, Roof labourer and Builder construction labourer) is part of the Catalogue of Training of the Public Employment Service Estatal (SEPE), the own catalogue of training of Fundación Laboral de la Construcción, and the Ministry of Education, Vocational Training and Sports of the Government of Spain.

The SEPE, together with the Public employment services of the autonomous communities, are at the National employment System in order to contribute to the development of employment policy, to manage the system of protection for unemployment and ensure information on the labour market. The Catalogue of Training Specialties is an instrument of transparency and dissemination of the integrated information system. Is valid and applies throughout the state and includes the management of the whole range of training under the National employment System. The purposes of the Catalogue:

- To adapt and update the training proposal to the requirements and needs of the labour market.
- Be a reference in the registration of training in records, when they meet the requirements specified in the catalogue.
- To facilitate the monitoring, evaluation and improving the quality of training.
- Be an instrument of support for career guidance carried out by the public employment services for the design of personalized itineraries for employment.

The Catalogue contains the training specialties understood as the grouping of competences, contents, and technical specifications that respond to:

- a set of activities falling into a phase of the production process and related functions.
- The acquisition of cross-cutting skills necessary for the proper exercise in the professional and context

The structure of the Catalogue of specialties is based on the secondment of each speciality to a family and Professional area. There are a total of 26 Professional Families and each of them has a different number of Professional Areas related to the different activities carried out.

For its part, Fundación Laboral has more than 50 training centers of its own and an offer composed of more than 200 training actions. The current Vocational Training offer under the Ministry of Education, Vocational Training and Sports includes 588 professional certificates, 175 training courses (Basic, Medium, and Higher degrees) and 21 specialization courses

The current training offer allows to face for the most part the competitive needs detected in the four selected profiles and considered as crucial in the BuildOffsiteEU project:

- Electrical installer. Most of the offer belongs to the SEPE Catalogue, to the professional families of Energy and water, Building and civil works, and Installation and maintenance. Also included are three FLC training actions and a vocational training degree from the Ministry of Education. The duration of the proposals ranges from 2000 to 6 hours. The competence not covered by the current training offer for this profile is the *Use of BIM models*.
- HVAC engineering technician. The professional families related to this profile are Building and civil works, Energy and Water, and Installation and maintenance, with a training offer ranging from 130 to 20 hours. No specific training offer for the *Lead a team perform maintenance on installed equipment*.

- Roof labourer. In addition to the professional families of Building and civil works, and Energy and water, specialties of the family of Safety and environment have been included for this profile. The proposed offer is completed by a formative action of FLC. The duration of the different initiatives ranges from 330 to six hours and the competitions that have not found specific offer have been *Program a CNC controller*, *Prepare the roof for solar system (PV and solar thermal system)*, and *Sort waste and demolition materials*.
- Builder construction labourer. The training offer included to address the gaps in this profile belongs to the professional family of Building and civil works, with a duration of between 110 and six hours, including two training actions from the catalogue of Fundación. No specific training initiative was found for the *Sort waste and demolition materials*.

The different training initiatives included in this proposal present both theoretical and practical contents directly related to energy efficiency, circular economy and sustainability, axes of the BuildOffsiteEU project.

Annex 1 - Fact sheets of the current training courses

Title of the course	ELECTRICAL AND AUTOMATIC INSTALLATIONS TECHNICIAN
Expected results	To assemble and maintain telecommunication infrastructures in buildings, low-voltage electrical installations, electrical machines and automated systems, applying current standards and regulations, quality, safety and occupational risk protocols, ensuring their functionality and respect for the environment.
Indicators	
Capacity	Learning outcomes by module: - **Industrial automation**: Determining the process to be followed in machining operations interpreting plans and using technical documentation. Drawing basic elements and assemblies applying standardisation. Perform machining operations applying measurement and marking techniques and using machines and tools. Configuring basic control and power circuits, selecting their elements and drawing up schemes. Assemble automatism circuits for small motor control, interpreting diagrams and verifying their operation. Assemble associated electrical panels and systems, interpreting technical documentation and verifying their operation. Locating breakdowns and malfunctions in the installation, analysing the symptoms and identifying the causes that produce them. Repairing breakdowns and malfunctions in the installation, adjusting or replacing defective elements. Assembling and maintaining automatic systems with programmable control, interpreting technical documentation and verifying their operation. Complying with the rules on labour risk prevention and environmental protection, identifying the associated risks, measures and equipment to prevent them. - **Electronics**: Recognise combinational logic circuits determining their characteristics and applications. Recognise sequential logic circuits determining their characteristics and applications. Recognise rectification and filtering circuits by determining their characteristics and applications. Recognise power supplies by determining their characteristics and applications. Recognise amplifier circuits by determining their characteristics and applications. Recognise power electronic systems by verifying their characteristics and operation.

	Recognise timing and oscillation circuits, verifying their characteristics and operation. - **Electrical engineering**: Perform calculations in direct current electric circuits, applying basic principles and concepts of electricity. Recognise the basic principles of electromagnetism, describing the interactions between magnetic fields and electric conductors and relating Faraday's Law with the principle of operation of electric machines. Perform calculations in single-phase alternating current (AC) electrical circuits, applying the most appropriate techniques. Perform calculations of the basic electrical magnitudes of a three-phase system, recognising the type of system and the nature and type of connection of the receivers. Recognise the risks and effects of electricity, relating them to the protection devices to be used and to the calculations of installations. Recognise the characteristics of transformers, carrying out tests and calculations and describing their constitution and operation. Recognise the characteristics of direct current machines carrying out tests and describing their constitution and operation. Recognise the characteristics of alternating current rotary machines by performing calculations and describing their constitution and operation. - **Interior electrical installations**: Assembling basic electrical circuits interpreting technical documentation. Assemble the electrical installation of a dwelling with a basic electrification level applying the Low Voltage Electrotechnical Regulations. Drawing up the technical design report of a housing installation with a high degree of electrification in accordance with the Low Voltage Electrotechnical Regulations. Assemble the electrical installation of a public premises, applying the regulations and justifying each element as a whole. Assemble the electrical installation of a premises intended for industrial use, complying with the Low Voltage Electrotechnical Regulations. Maintain interior installations applying electrical measurement techniques and relating the malfunction with the cause that produces it. Verify the commissioning of an installation in a public or industrial premises, complying with the specifications of the authorised installer in the Low Voltage Electrotechnical Regulations. - **Distribution facilities**: Identify the configuration and types of transformer substations, describing the characteristics and functions of each element. Identify the configuration of a low voltage distribution network, recognising its components and describing their characteristics according to the type of installation. Configure link installations selecting the elements that make them up and their location.

	Recognise maintenance procedures for transformer substations analysing protocols and identifying activities. Carrying out assembly and maintenance operations of a low voltage overhead network describing them and applying the corresponding techniques. Perform assembly and maintenance operations of a low voltage underground network describing them and applying the corresponding techniques. Carrying out assembly and maintenance operations of link installations describing them and applying the corresponding techniques. Complying with the rules on labour risk prevention and environmental protection, identifying the associated risks, measures and equipment to prevent them. - **Common telecommunication infrastructures in buildings and dwellings**: Identifying the elements of common telecommunications infrastructures in dwellings and buildings, analysing the systems that make them up. Configure small installations of common telecommunications infrastructures for dwellings and buildings, determining the elements that make them up and selecting components and equipment. Assemble common telecommunications infrastructures installations for dwellings and buildings, interpreting technical documentation and applying assembly techniques. Verifying and adjusting the elements of common telecommunications infrastructure installations, measuring significant parameters and interpreting their results. Locate breakdowns and malfunctions in common telecommunications infrastructure equipment and installations, applying detection techniques and relating the malfunction with the cause that produces it. Repair telecommunications infrastructure installations applying techniques for correcting malfunctions and, where appropriate, replacing components, taking into account the manufacturers' recommendations. Complying with the rules on labour risk prevention and environmental protection, identifying the associated risks and the measures and equipment to prevent them. - **Home automation installations**: Identify areas and automatic systems that make up automated installations in dwellings, analysing their operation, characteristics and application standards. Configure technical systems, justifying their choice and recognising their operation. Assemble small, automated installations in dwellings, describing the elements that make them up. Assemble the control areas of a home automation installation following the established procedures. Maintain home automation installations, attending to the system specifications. Diagnose breakdowns and malfunctions in home automation equipment and installations, applying measurement techniques and relating these with the causes that produce them. Complying with the rules on labour risk prevention and environmental protection, identifying the associated risks, measures and equipment to prevent them.

	- **Photovoltaic solar installations**: Identify the elements that make up photovoltaic solar energy installations, analysing their operation and characteristics. Configure photovoltaic solar installations, justifying the choice of the elements that make them up. Assemble photovoltaic solar panels by assembling their elements and verifying, where appropriate, their operation. Assemble photovoltaic solar installations interpreting technical documentation and verifying their operation. Maintain photovoltaic solar installations applying prevention and detection techniques and relating the malfunction with the cause that produces it. Recognising the grid connection conditions of photovoltaic solar installations in accordance with the regulations. Complying with the rules on labour risk prevention and environmental protection, identifying the associated risks, measures and equipment to prevent them. - **Electrical machinery**: Preparing technical documentation of electrical machines relating standardised symbols and graphically representing elements and procedures. Assemble single-phase and three-phase transformers, assembling their elements and verifying their operation. Repairing transformer breakdowns, carrying out checks and adjustments for commissioning. Assembling rotary electrical machines, assembling their elements and verifying their operation. Maintain and repair electrical machines, carrying out checks and adjustments for commissioning. Carrying out characteristic manoeuvres in rotary machines, interpreting diagrams and applying assembly techniques. Complying with the rules on labour risk prevention and environmental protection, identifying the associated risks, measures and equipment to prevent them. - **Training and career guidance**: Select employment opportunities, identifying the different possibilities of insertion, and the alternatives of lifelong learning. Apply teamwork strategies, assessing their effectiveness and efficiency for the achievement of the organisation's objectives. Exercise the rights and fulfil the obligations deriving from labour relations, recognising them in the different employment contracts. Determine the protective action of the Social Security system in view of the different contingencies covered, identifying the different types of benefits. Assess the risks derived from his/her activity, analysing the working conditions and risk factors present in his/her labour environment.

	Participate in the drawing up of a risk prevention plan in a small company, identifying the responsibilities of all the agents involved. Apply prevention and protection measures, analysing risk situations in the labour setting of the Technician of Electrical and Automatic Installations. - **Enterprise and entrepreneurship**: Recognise the skills associated with entrepreneurship, analysing the requirements derived from jobs and business activities. Defining the opportunity of creating a small company, assessing the impact on the environment and incorporating ethical values. Carrying out the activities for the constitution and start-up of a company, selecting the legal form and identifying the associated legal obligations. Carrying out basic administrative and financial management activities of an SME, identifying the main accounting and tax obligations and filling in the documentation. - **Training at work**: Identify the structure and organisation of the company relating it to the production and marketing of the products obtained. Apply ethical and labour habits in the development of his/her professional activity according to the characteristics of the job and the procedures established in the company. Assemble low voltage electrical installations applying current regulations, safety rules and the company's quality system. Collaborating in the operations and procedures for the start-up or service of installations and equipment following the established procedures. Carrying out preventive maintenance of the installations and equipment in charge of the company, applying the corresponding maintenance plans. Collaborating in the diagnosis and repair of breakdowns and malfunctions in installations and equipment, applying corrective maintenance techniques and procedures. Participating in the tasks of configuration and assessment of electrical installations and their legalisation, making diagrams and filling in the necessary documentation.
Knowledge	**Vocational modules**: - Industrial automation (165 hours) - Electronics (60 hours) - Electrical engineering (110 hours) - Interior electrical installations (165 hours) - Distribution facilities (65 hours) - Common telecommunication infrastructures in buildings and dwellings (65 hours) - Home automation installations (65 hours) - Photovoltaic solar installations (35 hours) - Electrical machinery (65 hours) - Training and career guidance (50 hours)

	- Enterprise and entrepreneurship (35 hours) - Training at work (220 hours)

Title of the course	**CONSTRUCTION OF SOLAR PHOTOVOLTAIC PERGOLAS**
Expected results	To build a wooden pergola using construction solutions adapted to the environment, local materials and climate, powered by photovoltaic solar energy.
Indicators	**Objectives**: Interpret carpentry as a sustainable work activity, the use of wood as a natural resource linked to forest management and understand the structural versatility of wood as a material. Execute all the foundation operations to be carried out in the project work, according to acceptable quality levels and in strict compliance with the specific safety regulations. Assemble the structure of the pre-machined pergola following the appropriate physical principles and surfaces to increase its durability, according to quality levels and safety regulations. Carrying out machining and assembly operations through correct joints and anchoring, according to the plans and using the necessary tools. Carrying out the assembly operations of the different elements and connection of the photovoltaic system in the pergola, following the specific quality and safety levels. Complying with the regulations and safety standards that guarantee the correct development of the work to be carried out from a preventive point of view.
Capacity	Learning outcomes by module: **Sustainable use of natural resources**: - **Cognitive and practical knowledge/skills**: introduction to bioconstruction; use of wood as a material; processing of wood; history of wood. - **Managerial, personal and social skills**: development of positive attitudes towards the use of wood as a natural and sustainable resource; awareness and application of the principles of using wood in bioconstruction; acquisition of an integral vision of the project to be built. **Foundations**: - **Cognitive and practical knowledge/skills**: identification of the different types of existing foundations; knowledge of the types of fixings, anchorages and load distribution; construction of the foundation base. - **Managerial, personal and social skills**: acquisition of a comprehensive vision of the project to be built; development of positive attitudes towards teamwork; demonstration of initiative and critical judgement in carrying out quality work. **Assembly of the pergola structure:** - **Cognitive and practical knowledge/skills**: knowledge of the different types of structures; knowledge of the necessary tools and techniques of use; knowledge of basic laws of physics applied to construction; care and maintenance.

	- **Managerial, personal and social skills**: application of environmental protection and occupational risk prevention measures; development of positive attitudes towards teamwork; demonstration of initiative and critical judgement in carrying out quality work. **Machining and assembly**: - **Cognitive and practical knowledge/skills**: reading the plan of the construction to be carried out; traditional machining; current machining; connections and anchoring. - **Managerial, personal and social skills**: development of positive attitudes towards teamwork; demonstration of initiative and critical judgement in carrying out quality work. **Photovoltaic assembly**: - **Cognitive and practical knowledge/skills**: theoretical introduction to photovoltaic solar energy; installation of the structures; installation of the photovoltaic solar panels; installation of the charger; installation of the connections. - **Managerial, personal and social skills**: development of positive attitudes towards renewable energies for electricity production, being aware of their utilities, advantages and disadvantages; reflection on the social, economic and environmental consequences of the use of one or another source for electricity production; demonstration of initiative and critical judgement when carrying out quality work. **Prevention of occupational hazards**: - **Cognitive and practical knowledge/skills**: common preventive techniques; definition of the work; specific preventive techniques. - **Managerial, personal and social skills**: development of analytical skills to solve problems and look for alternative solutions taking into account safety regulations and standards; awareness of the key elements to develop a safe work; assimilation of the importance of task planning to achieve a correct development of the work to be carried out from a preventive point of view.
Knowledge	Modules: Module 1. Sustainable use of natural resources (7 hours) Module 2. Foundations (7 hours) Module 3. Assembly of the pergola structure Module 4. Machining and assembly (35 hours) Module 5. Photovoltaic assembly (14 hours) Module 6. Prevention of occupational hazards (20 hours).

Title of the course	**INTERPRETATION OF PLANS**
Expected results	To apply the appropriate building and civil engineering drawing representation techniques for correct interpretation.
Indicators	**Objectives**: Identify the necessary graphic documentation in a project and locate the graphics and symbology useful for the interpretation of plans.

	Develop the skills and abilities that allow applying reasoned solutions to representation problems identifying the type of dimensions, perspective and normalising lines.
Capacity	Learning outcomes by module: **Principles of representation, lines, perspectives and standards**: - **Cognitive and practical knowledge/skills**: definition of the general principles of representation; description of standardised lines; description of perspective; explanation of dimensioning rules. - **Managerial, personal and social skills**: rigour in graphical representation and its applications in the professional environment. **Technical drawing**: - **Cognitive and practical knowledge/skills**: implementation of tools. - **Managerial, personal and social skills**: rigour in the correct selection of dimensions, perspectives and standard lines in the interpretation of plans based on practical application.
Knowledge	Modules: Module 1. Principles of representation, lines, perspectives and standards (10 hours) Module 2. Technical drawing (10 hours)

Title of the course	**PREVENTION OF OCCUPATIONAL RISKS IN ELECTRICAL WORK**
Expected results	To acquire training in occupational risk prevention in the construction sector in accordance with the second cycle training programme by trade for electricity, assembly and maintenance of high and low voltage electrical installations, of the current General Agreement for the Construction Sector.
Indicators	
Capacity	Learning outcomes by module: **Prevention of Occupational Risks in electrical works**: - **Cognitive and practical knowledge/skills**: COMMON PART. Preventive techniques (collective protection means; individual protection equipment; signposting); auxiliary means, equipment and tools commonly used on construction sites; verification, identification and monitoring of the workplace and its environment (general risks on construction sites; knowledge of the workplace environment; planning of tasks from a preventive point of view; handling of chemical products. Safety data sheet. Symbology); interferences between activities (simultaneous or successive activities); rights and obligations (general and specific regulatory framework; organisation of occupational risk prevention; participation, information, consultation and proposals); operational and legal compliance. General concepts, responsibilities and consultation channels; first aid and emergency measures. SPECIFIC PART. Definition of the work (foreseeing the needs of the different electrical equipment; overhead and underground high and low voltage electrical lines; transformation centres; substations; industrial and building electrical assembly and maintenance; provisional site installations); specific preventive techniques (risk identification; risk assessment of the job (generic); auxiliary means (lifting platforms, scaffolding, ladders, pulling, braking, splicing machines, pulleys, jacks, conductor exit trolleys, lifting poles, etc.);

	specific preventive techniques (risk identification; risk assessment of the job (generic); auxiliary means (lifting platforms, scaffolding, ladders, pulling, braking, splicing machines, pulleys, jacks, conductor exit trolleys, lifting poles, etc.). - **Managerial, personal and social skills**: managerial skills, personal and social, that are necessary for the achievement of the above learning outcomes will be addressed. **Linkages with professional training**: This training allows, together with the fulfilment of the additional requirements established in the General Agreement of the Construction Sector, to apply for the Construction Professional Card (TPC).
Knowledge	Module 1. Prevention of Occupational Risks in electrical works (20 hours)

Title of the course	**PREVENTION OF OCCUPATIONAL RISKS IN ELECTRICAL WORK. SPECIFIC PART**
Expected results	To acquire training in the prevention of occupational hazards in the construction sector in accordance with the training program of second cycle per trade for electricity, assembly and maintenance of high and low voltage electrical installations (specific part), of the current General Agreement of the Construction Sector.
Indicators	
Capacity	Learning outcomes by module: **Prevention of Occupational Risks in electronical work. Specific part**: - **Cognitive and practical knowledge/skills**: definition of work (forecasting of the needs of different electrical equipment; high and low voltage overhead and underground power lines; processing centres; substations; industrial electrical assembly and maintenance and building; temporary construction facilities); specific preventive techniques (Risk identification; post risk assessment (generic); auxiliary means (lifting platforms, scaffolding, ladders, draft, brake, splicing machines, pulleys, jacks, conductor exit carts, voltage-free verification poles); work equipment and tools: risks and preventive measures; RD 614/2001; manual handling of loads; work at height; collective protection means (placement, uses and obligations and maintenance); individual protection means (placement, uses and maintenance) and maintenance); materials and products (labelling, safety data sheets, H and P phrases...); use of lifelines, vertical and horizontal, in the different types of anchors and structures. - **Managerial, personal and social skills**: managerial skills, personal and social, that are necessary for the achievement of the above learning outcomes will be addressed. **Linkages with professional training**: This training allows, together with the fulfilment of the additional requirements established in the General Agreement of the Construction Sector, to apply for the Construction Professional Card (TPC).
Knowledge	Module. Prevention of Occupational Risks in electrical works. Specific part (6 hours)

Title of the course	ELECTRICAL INSTALLATION AND COMMISSIONING OF SOLAR PHOTOVOLTAIC SYSTEMS
Expected results	To carry out electrical assembly and commissioning of solar photovoltaic installations on the basis of technical documentation, using the appropriate tools, equipment and materials and acting under personal safety and environmental risk prevention standards, and drawing up work plans for the electrical assembly of solar photovoltaic installations in accordance with the corresponding projects or technical reports and established work procedures.
Indicators	**Objectives**: Organize the assembly by determining the necessary elements and equipment from the technical documentation and applying the measures of prevention of occupational and environmental risks throughout the process. Know and apply the techniques for the assembly of equipment in the photovoltaic installation.
Capacity	Learning outcomes by module: **Organization of materials, equipment and tools for the assembly of electrical and electronic equipment**: - **Cognitive and practical knowledge/skills**: identification and selection of equipment and elements necessary for assembly from installation plans; organization of assembly of electrical and electronic circuits and equipment, techniques and procedures; basic notions of applicable regulations for the prevention of specific occupational and environmental risks. Personal protective equipment. - **Managerial, personal and social skills**: Communication skills with the work team; time management; organization of materials, equipment and tools. **Assembly of electrical and electronic equipment in solar photovoltaic installations**: - **Cognitive and practical knowledge/skills**: Techniques to be used in the electrical assembly processes (laying, embedding, connecting and adjusting); assembly and connection of circuits and electrical and electronic equipment of solar photovoltaic installations (accumulation systems; support systems; network connections; ground circuits); assembly and connection of solar panels (grouping and connection systems); assembly and connection of circuits and monitoring equipment and an automatic solar monitoring system; interconnection of the different subsystems of solar photovoltaic installations; assembly and connection of electrical switchboards for manoeuvre, protection and control; assembly of conduction pipes and cables; commissioning of solar photovoltaic installations; Regulation. - **Managerial, personal and social skills**: Communication skills with the work team; time management; organization of materials, equipment and tools.
Knowledge	Modules: Module 1. Organization of materials, equipment and tools for the assembly of electrical and electronic equipment (15 hours). Module 2. Assembly of electrical and electronic equipment in solar photovoltaic installations (45 hours).

Title of the course	**INSTALLATION AND MAINTENANCE OF PHOTOVOLTAIC SOLAR ENERGY INSTALLATIONS**
Expected results	To install and maintain a solar photovoltaic installation, taking into account the characteristics of the system to be installed and its main equipment.
Indicators	**Objectives**: Know the European and state legal context and introduce photovoltaic technology and the typologies of existing installations today. Acquire basic and general preventive knowledge, both theoretically and practically, which allows the application of safe working techniques during the execution of metal structures. Assemble the anchor, structure and panels of a photovoltaic system. Install the wiring layout, protection boxes and connect the continuous and alternating power part with the appropriate material of a solar photovoltaic system. Maintain and monitor for the correct operation and continuous improvement of solar photovoltaic installations.
Capacity	Learning outcomes by module: **Introduction to solar photovoltaics**: - **Cognitive and practical knowledge/skills**: legal contextualization of the electricity sector (European and State regulations); introduction of solar photovoltaics (isolated installations in the grid, installations connected to the grid). - **Managerial, personal and social skills**: Legal contextualization of photovoltaic installations. **Primary equipment:** - **Cognitive and practical knowledge/skills**: Study of the characteristics of the photovoltaic generator (photovoltaic panels and parameters that affect its operation; optimal location, inclination and orientation depending on the location and design of the installation); analysis of the characteristics of the main equipment in isolated photovoltaic installations of the network (load regulators, inverters, solar pumps, inverter chargers, generators); analysis of the characteristics of the main equipment in photovoltaic installations connected to the network (inverters, inverter chargers, managers and other communication devices); identification of the different battery technologies for electrical accumulation in photovoltaic systems (advantages of each technology, technical characteristics of each technology, applications depending on the technology). - **Managerial, personal and social skills**: Definition of the inclination and orientation of the photovoltaic generator according to the location and purpose of the installation; identification of the technical characteristics of the main equipment of the installation. **Mechanical assembly:** - **Cognitive and practical knowledge/skills**: knowledge of the assembly procedure of the different types of anchors, structures, photovoltaic solar panels. - **Managerial, personal and social skills**: analysis of the installation and the conditions of its promoter to define the optimal anchoring and structure; mechanical assembly of a simple photovoltaic system.

	Electrical connection: - **Cognitive and practical knowledge/skills**: selection and connection of the main equipment taking into account its electrical characteristics (serial or parallel connection of photovoltaic solar panels; connection to regulator and/or inverters in isolated systems of the network; connection to inverter in systems connected to the network); identification of the appropriate protections (types of protections in direct current, types of protections in alternating current, dimensioning of protections, unifilar schemes). - **Managerial, personal and social skills**: analysis of the suitability of the main equipment for electrical connection; reconsideration of the unsuitable equipment by others that can be connected safely, electrical connection of a simple photovoltaic system. **Monitoring. Maintenance and monitoring**: - **Cognitive and practical knowledge/skills**: Monitoring of a solar photovoltaic installation (equipment to communicate a photovoltaic system, layout of communication wiring if available, types of communication); planning of maintenance of a photovoltaic system (preventive maintenance and corrective maintenance); energy management (changes in consumption habits, management of tariffs, diversion of consumption). - **Managerial, personal and social skills**: analysis of consumption and generation to increase the use of photovoltaic solar installations; anticipation of possible breakdowns of the installations.
Knowledge	Modules: Module 1. Introduction to solar photovoltaics (3 hours) Module 2. Primary equipment (15 hours). Module 3. Mechanical assembly (10 hours). Module 4. Electrical connection (15 hours). Module 5. Monitoring. Maintenance and monitoring (7 hours).

Title of the course	**PHOTOVOLTAIC SOLAR ENERGY FOR SELF-CONSUMPTION. LEVEL I**
Expected results	To acquire knowledge of electrical installations in self-consumption photovoltaic installations.
Indicators	**Objectives**: Analyse the current context of self-consumption photovoltaic installations. Identify the operation of photovoltaic solar panels. Design a photovoltaic installation for self-consumption, interpreting the main elements.
Capacity	Learning outcomes by module: **Current self-consumption context**: - **Cognitive and practical knowledge/skills**: Analysis of the current situation of the self-consumption photovoltaic sector (national and international context; legal framework).

	- **Managerial, personal and social skills**: Predisposition to learn new tools in the self-consumption photovoltaic sector; commitment to the generation of a more sustainable society. **The photovoltaic panel:** - **Cognitive and practical knowledge/skills**: identification of the key elements of photovoltaic panels (use of the Sun as a renewable resource; panels and their main elements; placement of panels to improve the performance of the installation). - **Managerial, personal and social skills**: Interest in renewable energies and the positive impact they have; rigor in the management and maintenance of photovoltaic installations. **Photovoltaic installation:** - **Cognitive and practical knowledge/skills**: Identification of the main elements for the design of a self-consumption photovoltaic installation (installation elements; installation dimensioning). - **Managerial, personal and social skills**: rigor to design a self-consumption photovoltaic installation with the elements and needs detected; awareness of the importance of the use of renewable energies for the development of society.
Knowledge	Modules: Module 1. Current self-consumption context (10 hours) Module 2. The photovoltaic panel (10 hours). Module 3. Photovoltaic installation (10 hours).

Title of the course	**PHOTOVOLTAIC SOLAR ENERGY FOR SELF-CONSUMPTION. LEVEL II**
Expected results	To expand the knowledge of electrical installations in the field of photovoltaic electrical installations for self-consumption, in order to be able to carry out their installation.
Indicators	**Objectives**: Identify the elements and requirements for the installation of photovoltaic solar panels for self-consumption. Identify the characteristics of the elements that form the photovoltaic solar installation. Perform maintenance of solar photovoltaic installations for self-consumption.
Capacity	Learning outcomes by module: **Photovoltaic installation requirements**: - **Cognitive and practical knowledge/skills**: identification of the elements and requirements for a self-consumption photovoltaic solar installation (Legal requirements contained in the State regulations; elements necessary for the installation; characteristics of the installation; amortization of the installation). - **Managerial, personal and social skills**: rigor to carry out an objective analysis of the photovoltaic installation.

	The elements of the installation: - **Cognitive and practical knowledge/skills**: Classification of the elements necessary to perform the installation according to the needs of the customer; configuration of the panel field; identification and selection of electrical protections; selection of the batteries. - **Managerial, personal and social skills:** Interest in knowing the elements of photovoltaic solar installations. **Maintenance of the facility:** - **Cognitive and practical knowledge/skills**: description of maintenance tasks (need for maintenance of solar PV installation elements; tools required). - **Managerial, personal and social skills: a**wareness to extend the life of the photovoltaic solar installation for self-consumption through proper maintenance.
Knowledge	Modules: Module 1. Photovoltaic installation requirements (10 hours) Module 2. The elements of the installation (15 hours). Module 3. Maintenance of the facility (5 hours).

Title of the course	**AEROTHERMAL AND PHOTOVOLTAIC: INTEGRATED RENEWABLE ENERGIES**
Expected results	To design, maintenance and commissioning of aerothermal and photovoltaic installations in an integrated way following safety standards according to regulations.
Indicators	**Objectives**: Identify and conceptualize the fundamentals of renewable energies, aerothermal and photovoltaic and solar photovoltaic energy, for its subsequent application in the design and assembly of facilities. Design hybrid and integrated systems, applying the basic principles of devices and components of aerothermal and solar photovoltaic installations. To carry out the start-up of the aerothermal and photovoltaic installations and execute the maintenance plan with the aim of optimizing the results and ensuring a quality system of them. Identify faults in aerothermal and solar photovoltaic installations. Analyse and understand the applicable regulations regarding the prevention of occupational risks in the context of renewable energies, specifically in solar and aerothermal energy installations.
Capacity	Learning outcomes by module: **Introduction to renewable energy: Aerothermal energy and solar photovoltaics**: - **Cognitive and practical knowledge/skills**: identification of basic concepts of renewable energies; contextualization of the fundamental concepts of aerothermal energy; contextualization of the fundamental concepts of solar photovoltaic energy (principles of

	solar photovoltaic generation, key components of a photovoltaic system, advantages and limitations). - **Managerial, personal and social skills**: Assimilation of the fundamentals of aerothermal and photovoltaic energy; show active predisposition to learning and adaptation to change. **Technical and operational background. Design and implementation of integrated hybrid systems:** - **Cognitive and practical knowledge/skills**: identification and application of aerothermal plant devices and components; identification and application of component and type of solar photovoltaic and thermal power plants; development of aerothermal plant designs; development of photovoltaic plant designs; analysis of hybrid systems and integrated systems. - **Managerial, personal and social skills**: proactive attitude and initiative in the development and application of design of aerothermal installations and solar photovoltaic energy; Reflective analysis capacity respect the impact of the implementation of hybrid systems in industry and buildings in general. **Commissioning and maintenance of facilities:** - **Cognitive and practical knowledge/skills**: implementation of the start-up process; development of a maintenance plan; management and control of systems. - **Managerial, personal and social skills**: self-assessment of the final quality of the work carried out in the commissioning of the designed installations; autonomy and resolution capacity in the maintenance of the aerothermal and solar photovoltaic installations, guaranteeing their viability. **Identification of faults in installations:** - **Cognitive and practical knowledge/skills**: identification of the fundamental aspects of breakdowns; aerothermal breakdown analysis; analysis of breakdowns in solar installations. - **Managerial, personal and social skills**: proactive attitude for early detection of faults in facilities, in order to solve problems effectively; initiative, versatility and ability to solve faults according to the type of installation. **Prevention of occupational hazards in aerothermal and renewable energy installations/maintenance:** - **Cognitive and practical knowledge/skills**: Analysis and management of applicable regulations in occupational risk prevention; risk factors; emergency and evacuation plans. - **Managerial, personal and social skills**: internalization of safety standards in the commissioning of aerothermal and solar photovoltaic installations; assimilation of the importance of the application of the regulations for the improvement of the final quality of the work carried out.
Knowledge	Modules: Module 1. Introduction to renewable energy: Aerothermal energy and solar photovoltaics (80 horas).

	Module 2. Technical and operational background. Design and implementation of integrated hybrid systems (80 hours). Module 3. Commissioning and maintenance of facilities (30 hours). Module 4. Identification of faults in installations (30 hours). Module 5. Prevention of occupational hazards in aerothermal and renewable energy installations/maintenance (30 hours).

Title of the course	**AUXILIARY OPERATIONS IN PHOTOVOLTAIC SOLAR INSTALLATIONS. ASSEMBLY**
Expected results	To perform auxiliary operations in the assembly of photovoltaic solar installations, following the technical instructions received from the superior or person in charge and the established prescriptions in terms of health and safety, quality and environmental protection.
Indicators	
Capacity	
Knowledge	1. Preparation of material and tools for the assembly of photovoltaic solar installations. 2. Checking the workspace and supports where the installations are to be carried out. 3. Assembly of supports and structures for photovoltaic solar installations. 4. Assembly of wiring, batteries, accessories and components of photovoltaic solar installations and putting them into service. 5. End-of-day operations carried out on photovoltaic solar installations. 24 theoretical hours, 36 practical hours

Title of the course	**AUXILIARY OPERATIONS IN SOLAR THERMAL INSTALLATIONS. MAINTENANCE**
Expected results	To perform auxiliary operations in the maintenance of solar thermal installations, following the technical instructions received from the superior or person in charge and the established prescriptions in terms of health and safety, quality and environmental protection.
Indicators	
Capacity	
Knowledge	1. Preparation of material and tools for the maintenance of solar thermal installations. Checking of the workspace and supports where the maintenance operations of the installations will be carried out. 3. Maintenance of pipes, accessories and components of solar thermal installations. 4. Maintenance of electrical equipment and components of solar thermal installations. 5. 5.End-of-day operations carried out on solar thermal installations. 12 theoretical hours, 18 practical hours

Title of the course	**AUXILIARY OPERATIONS IN PHOTOVOLTAIC SOLAR INSTALLATIONS. MAINTENANCE**
Expected results	To carry out auxiliary operations in the maintenance of photovoltaic solar installations, following the technical instructions received from the superior or person in charge and the established prescriptions in terms of health and safety, quality and environmental protection.
Indicators	
Capacity	
Knowledge	1. Preparation of material and tools for the maintenance of photovoltaic solar installations. 2. Checking the workspace and supports where the maintenance operations of photovoltaic solar installations are to be carried out. 3. Maintenance of supports and structures of photovoltaic solar installations. 4. Maintenance of wiring, batteries, accessories and components of solar photovoltaic installations. 5. End-of-day operations carried out on photovoltaic solar installations. 12 theoretical hours, 18 practical hours

Title of the course	**HOME AUTOMATION**
Expected results	To apply the elements of home automation projects in the house for the design of basic facilities and the verification of their commissioning.
Indicators	**Objectives**: Identify the basic concepts of home automation and its management integrated into the building systems. Identify the different applications of home automation and its characteristics. Identify the different home automation equipment depending on the type of installation that is applied to it. Identification of the different equipment and software associated with the facilities and by remote control. List the types of applications of home automation and their characteristics. Develop a practical home automation installation project for a single-family home.
Capacity	Learning outcomes by module: **Basics and applications**: - **Cognitive and practical knowledge/skills**: introduction to the basic concepts (definition of the home automation system, historical development and current state, characteristics, functionality). - **Managerial, personal and social skills**: interest in the basic concepts and the current context in the use of the home automation system. **Types of applications of home automation**: - **Cognitive and practical knowledge/skills**: interpretation of basic schemes (types of facilities, switchgear). - **Managerial, personal and social skills**: assimilation of basic schemes and types of installations in the home automation system. **Housing Facilities**: - **Cognitive and practical knowledge/skills**: identification of housing facilities (detection systems, climate and water facilities, lighting systems and/or enclosures); composition of communication networks. - **Managerial, personal and social skills**: assimilation of the various facilities in the house and its communication and connection systems. **Control equipment and software:** - **Cognitive and practical knowledge/skills**: identification of home automation technology and its products (characteristics, application environments, comfort). - **Managerial, personal and social skills**: readiness to learn the various characteristics and applicability of home automation technology. **Applications of home automation:**

	- **Cognitive and practical knowledge/skills**: application of home automation (security systems, improved comfort; equipment control; energy saving). - **Managerial, personal and social skills**: rigorous monitoring of safety standards in the process of applying home automation technology; awareness of the importance of energy savings in the application of home automation technology. **Project development:** - **Cognitive and practical knowledge/skills**: Development of a project for home automation (installation of equipment, connection and communication). - **Managerial, personal and social skills**: acquisition of tools for the development and elaboration of a project with home automation installation.
Knowledge	Modules: Module 1. Basics and applications (10 hours) Module 2. Types of applications of home automation (10 hours) Module 3. Housing Facilities (10 hours) Module 4. Control equipment and software (10 hours) Module 5. Applications of home automation (10 hours) Module 6. Project development (10 hours)

Title of the course	**DESIGN AND OPTIMISATION OF UNDERFLOOR HEATING FOR EFFICIENT CLIMATE CONTROL**
Expected results	To design underfloor heating systems adapted to different needs, optimizing their performance and ensuring maximum energy efficiency
Indicators	**Objectives**: Develop competencies in the technical design of underfloor systems, including the selection of materials, performance calculations and adaptation to different construction environments, to ensure efficient and sustainable air conditioning solutions. Acquire knowledge and practical skills in the latest air conditioning technologies and automated control systems, including their integration and application in designs of underfloor systems, to improve energy efficiency and functionality in modern air conditioning projects. Implement and maintain efficient air conditioning systems, including underfloor heating, using advanced techniques, safety and efficiency regulations, and sustainable practices.
Capacity	Learning outcomes by module: **Technical design of underfloor heating:** - **Cognitive and practical knowledge/skills**: selection and characterization of materials for underfloor heating; calculation of the performance of underfloor heating systems; adaptation of designs to different construction environments. - **Managerial, personal and social skills**: Effective communication to express technical ideas clearly facilitating collaboration and mutual understanding in radiant floor design projects;

	management of air conditioning projects; problem solving in technical design environments; adaptation to technological and regulatory changes. **Emerging technologies and automated control in air conditioning**: - **Cognitive and practical knowledge/skills**: integration of Automated Control Systems in HVAC; analysis of Emerging Technologies in HVAC; adaptation and application of these technologies in the context of radiant soils. - **Managerial, personal and social skills**: Effective implementation of new technologies in air conditioning projects (application of technological innovations effectively and efficiently in real air conditioning contexts); development of analytical and critical thinking; awareness of the importance of interdisciplinary work in the development of automated air conditioning systems (development of skills for collaborative work; continuous adaptation to technological advances in air conditioning). **Implementation and maintenance of efficient air conditioning systems**: - **Cognitive and practical knowledge/skills**: development of advanced techniques in the implementation of air conditioning systems; effective maintenance of efficient air conditioning systems. - **Managerial, personal and social skills**: Effective coordination in HVAC implementation projects; clear communication to technically explain processes and recommendations for efficient HVAC systems; adaptation to unforeseen situations during implementation and maintenance.
Knowledge	Modules: Module 1. Technical design of underfloor heating (50 horas) Module 2. Emerging technologies and automated control in air conditioning (40 horas) Module 3. Implementation and maintenance of efficient air conditioning systems (40 horas)

Title of the course	**QUALITY AND ENVIRONMENT IN CONSTRUCTION 4.0**
Expected results	To acquire the knowledge, skills and abilities necessary to develop, interpret and apply quality and environmental plans and projects in construction
Indicators	**Objectives**: Understand the contemporary context of construction 4.0 as well as the challenges it faces. Understand the objectives and mechanisms of digital transformation in construction 4.0, as well as its impact on agents and positions linked to the construction sector. Understand and apply the tools of digital transformation and acquisition of an approach based on digital processes. Develop learning mechanisms to apply to emerging digital technologies. Learn sustainability criteria and their application in construction 4.0. Know the mechanisms around the control of waste in the world of construction (circular economy, digital waste management and data processing) to develop action plans towards the future.

Capacity	Learning outcomes by module: **Digital transformation and its objectives in construction 4.0**: - **Cognitive and practical knowledge/skills**: knowledge of the definition of digital tools under construction; knowledge of the main digital tools in construction; advantages of the main digital tools under construction; knowledge of the main digital tools in construction; objectives of digital transformation in construction 4.0; knowledge of the objectives to which digital transformation is directed in construction 4.0. - **Managerial, personal and social skills**: development of skills for the management of digital tools in construction; empathy in understanding the objectives of digital transformation. **Quality management in construction 4.0**: - **Cognitive and practical knowledge/skills**: Digital transformation and Management Systems; knowledge of the advantages of digital transformation; knowledge of different management systems; emerging digital technologies; knowledge of different emerging technologies; Basic knowledge of mobility management, Cloud Computing, Big Data, Internet of All Things, Cognitive Computing and Smart Cities; organization in the digital ecosystem; development of an organizational criterion within the digital ecosystem; knowledge of the hierarchies and organizational structures of the digital domain; digital customer approach; development of empathy in dealing with the digital customer; knowledge of the needs of the digital customer; digital operations and processes; knowledge of operations for quality management in construction; knowledge of digital processes linked to management. - **Managerial, personal and social skills**: development of management skills of digital management tools; digital information organization capacity; development of empathy for digital customer service; ability to organize and design digital operations and processes. **Sustainability in construction 4.0**: - **Cognitive and practical knowledge/skills**: sustainability as a holistic concept; knowledge and debate on the definition of sustainability; application of the concept of sustainability to construction; Sustainable Development Goals; capacity for critical analysis according to the sustainable development goals; knowledge of the sustainable development goals; carbon footprint and environmental footprint; knowledge of the implications of the concept of carbon footprint and environmental footprint; analytical attitude towards strategies for treating carbon footprint and digital footprint; adaptation and mitigation of climate change; knowledge of strategies for adaptation and mitigation of climate change; knowledge of the consequences of climate change; critical attitude and capacity for debate around climate change. - **Managerial, personal and social skills**: development of a critical attitude towards climate change; awareness of the concept of climate change and its consequences; ability to detect incompatibilities with sustainable models; development of critical thinking towards the organization of strategies aimed at adaptation and mitigation of climate change. **Waste Management**: - **Cognitive and practical knowledge/skills**: circular economy; knowledge of circular economy strategies; advantages of the application of circular economy in the construction

	sector; technology in waste management; knowledge of artificial intelligence strategies; use of drones, virtual reality systems and augmented reality; development of data processing strategies; action plan towards the future; automation of waste management systems; digitization of the data obtained. - **Managerial, personal and social skills**: development of digital skills linked to the use of virtual reality, artificial intelligence, augmented reality, robotics, use of databases and drones; awareness about the circular economy; capacity for coordination between the different sectors related to waste management; critical analysis capacity in favour of the development of future plans. **Linkages with professional training:** Obtaining the qualification as Technician Responsible for Occupational Risk Prevention, Quality and Environment specialized in Quality and Environment in Construction 4.0.
Knowledge	Modules: Module 1. Digital transformation and its objectives in construction 4.0 (2 horas) Module 2. Quality management in construction 4.0 (24 horas) Module 3. Sustainability in construction 4.0 (24 horas) Module 4. Waste Management (30 horas)

Title of the course	**DESIGN OF GEOTHERMAL OR AEROTHERMAL SYSTEMS**
Expected results	To acquire the knowledge and skills necessary to design a geothermal or aerothermal installation that provides air conditioning and/or domestic hot water (DHW) to a building.
Indicators	**Objectives**: Acquire knowledge of the basic thermodynamic foundations to be able to design geothermal and aerothermal installations. Acquire knowledge of the basic foundations of aerothermal and geothermal energy, the origin of energy, methods of extraction of it and its possible applications. Acquire the basic foundations of low temperature geothermal installations to be able to design facilities (heat or cold) in buildings. Acquire the basic foundations of soil properties that affect the performance of low temperature geothermal installations. Acquire the basics about the necessary equipment in aerothermal or geothermal installations in buildings. Acquire the basic foundations for the dimensioning of aerothermal or geothermal installations in buildings. Acquire the basic knowledge for the commissioning and maintenance management of aerothermal or geothermal installations in buildings.
Capacity	Learning outcomes by module: **Thermodynamic foundations**:

	- **Cognitive and practical knowledge/skills**: fundamentals of thermodynamics (heat; temperature, specific heat; sensitive and latent heat; thermal machine; heat cycle; heat pump; stages in the cycle of a heat pump; performance of a heat-cooling pump, heating; energy consumed by a heat pump). - **Managerial, personal and social skills**: ability to understand the basic principles of thermodynamics with which a heat pump works using aerothermal or geothermal. **The basics of aerothermal and geothermal**: - **Cognitive and practical knowledge/skills**: Fundamentals of aerothermal and geothermal (introduction to aerothermal and geothermal; basics; core; harnessing; hygrothermal; geo-pressurized; hot rock system; environmental impact). - **Managerial, personal and social skills**: Ability to identify and analyse the possibilities of applying aerothermal and geothermal energy as renewable energy sources in buildings. **Fundamentals of low enthalpy geothermal**: - **Cognitive and practical knowledge/skills**: Fundamentals of low enthalpy or low temperature geothermal installations. - **Managerial, personal and social skills**: Ability to understand the basic principles with which a heat pump works using aerothermal or geothermal. **Properties of soil**: - **Cognitive and practical knowledge/skills:** familiarization with soil characteristics; sounding; drilling; thermal response test. - **Managerial, personal and social skills**: Ability to understand the main characteristics that make up the soils. **Aerothermal and geothermal equipment**: - **Cognitive and practical knowledge/skills**: Characteristics of equipment and materials. - **Managerial, personal and social skills**: Ability to understand the main characteristics of the equipment and materials needed in this type of facility. **Design of aerothermal and geothermal installations**: - **Cognitive and practical knowledge/skills**: Fundamental principles (thermal demand for domestic hot water; design of domestic hot water systems; thermal demand for heating and cooling; selection of the heat pump; dimensioning of an inertia tank; simultaneous cold and heat utilization; design of other elements of a facility; dimensioning of the hydraulic circuit; regulation and control). - **Managerial, personal and social skills**: Ability to understand the main characteristics of the equipment and materials needed in this type of facility. **Implementation and maintenance of aerothermal and geothermal**: - **Cognitive and practical knowledge/skills**: fundamental principles (installation performance; assembly; vertical geothermal execution; horizontal geothermal execution;

	legal aspects in the execution of installations; installation commissioning; watertightness testing of pipeline networks; installation maintenance; preventive maintenance). - **Managerial, personal and social skills**: Ability to understand the main aspects of the maintenance of equipment and materials needed in this type of facility.
Knowledge	Modules: Module 1. Thermodynamic foundations (5 hours) Module 2. The basics of aerothermal and geothermal (5 hours) Module 3. Fundamentals of low enthalpy geothermal (5 hours) Module 4. Properties of soil (5 hours) Module 5. Aerothermal and geothermal equipment (10 hours) Module 6. Design of aerothermal and geothermal installations (15 hours) Module 7. Implementation and maintenance of aerothermal and geothermal (5 hours)

Unit of competence	**MANAGE SERVICES IN THE IT SYSTEM**
Expected results	To install, implement and maintain computer and communications elements in automation systems of domotic and inmotic buildings, access control and presence and video surveillance at the level of "hardware" and "software", ensuring its functionality, according to specifications and updating elements to add improvements and correct faults, under security conditions, complying with applicable environmental regulations, in matters of data protection and intellectual and industrial property, prevention of occupational risks, as well as quality standards.
Indicators	**Objectives**: Manage system configuration to ensure process performance based on usage needs, considering deployments in dedicated or distributed architectures, with and without virtualization, and complying with organizational directives. Manage storage according to usage needs, considering deployments in dedicated or distributed architectures, with and without virtualization and complying with organizational policies. Manage user tasks to ensure access to the system and availability of resources according to operating specifications of the computer system. Manage network services to ensure communication between computer systems according to operational needs.
Capacity	- Analyse system processes, ensuring performance according to the parameters specified in the exploitation plan considering deployments in dedicated or distributed architectures, with and without virtualization layer. - Implement storage management procedures to provide the user with a system for recording information that is complete, confidential and available. - Manage access to the system and resources to secure them, restricting their use depending on the access profile.

	- Evaluate the use and performance of communications services to keep them within the specified parameters. - Maintain the work area with the proper degree of order and cleanliness. - Demonstrate a degree of autonomy in the resolution of related contingencies with your activity. - Demonstrate creativity in the development of the work you do. Interpret and execute work instructions. - Demonstrate resistance to stress, mood stability, and impulse control. - Appreciate talent and professional performance regardless of sex. - Show an attitude of respect towards peers, procedures and rules of the company. - To comply with measures that favour the principle of equal treatment and opportunities between men and women. - Effectively implement the principle of equal treatment and non-discrimination in working conditions between women and men.
Knowledge	Contents: 1. Processes in the computer system 2. Storage in service management. 3. User management in service management. 4. Communications services in service management.

Unit of competence	**INSTALLING INFRASTRUCTURE IN HOME AND BUILDING AUTOMATION SYSTEMS**
Expected results	General competence: to install, implement and maintain computer and communications elements in automation systems of domotic and inmotic buildings, access control and presence and video surveillance at the level of "hardware" and "software", ensuring its functionality, according to specifications and updating elements to add improvements and correct faults, under security conditions, complying with applicable environmental regulations, in matters of data protection and intellectual and industrial property, prevention of occupational risks, as well as quality standards.
Indicators	**Objectives**: Carry out the collection of materials, tools and equipment for the installation of the home automation or computer system, after selection, from the technical documentation of work and instructions received, checking them and transporting them in conditions of quality and safety, for subsequent installation. Install the cabinets, main and secondary panels, as well as boxes for manoeuvres and derivations of the home automation and computer systems, locating them in the places indicated in the technical project, after rethinking, following the procedures established in the technical documentation of the manufacturer and instructions received from the entity responsible for the installation, in conditions of quality and safety, to implement the project. Tender the wiring of manoeuvre, force and control of the circuits of the home and computer systems, after installation of the pipes, connecting the wiring in the bypass elements,

	following the specifications of the project, the procedures established in the technical documentation of the manufacturer and instructions received from the entity responsible for the installation, for the connection of the elements. Install the equipment and devices of the home automation and computer system, labelling them and connecting them according to the technical documentation, the project and in conditions of quality and safety, to obtain a functional system. To carry out the start-up of the home automation and computer systems, carrying out prior checks and measures, in accordance with the technical documentation, the instructions and procedures of the entity responsible for the installation and the manufacturer's standards, under safe conditions, to verify the installation carried out.
Capacity	- Define components and characteristics of a home automation and computer system, identifying components and relating elements, analysing a technical documentation for the implementation of the system. - Apply techniques to carry out the collection of materials, relating and classifying tools to be used and defining criteria for the selection of materials, equipment, from a technical documentation of work, defining how to check them for transport and storage, where appropriate, in conditions of quality and safety, to face an installation. - Apply procedures for the installation of cabinets, identifying locations of main and secondary panels, as well as boxes for manoeuvres and derivations of a home automation and computer system, describing procedures for installation, fixing and labelling, as indicated by the technical documentation of the manufacturers and a technical project, in conditions of quality and safety to ensure its functionality. - Apply procedures for installing the pipes and laying wiring for manoeuvre, force and control of the circuits of a home automation and computer system, describing the connection of the wiring in the bypass elements, following technical documentation and in conditions of quality and safety for subsequent installation and connection of equipment. - Apply procedures for the installation of equipment and devices of a home automation and computer system, classifying equipment and devices, describing the labelling and connection process according to technical documentation and in conditions of quality and safety to obtain an interconnected system. - Apply procedures for the implementation of a home automation and computer system, describing the previous checks and measures, according to the technical documentation and standards of the manufacturer and under safe conditions to obtain a functional system. - Finalize the work according to criteria of suitability, speed, economy and efficiency. - Demonstrate a degree of autonomy in the resolution of contingencies related to their activity. - Adapt to the organization, its organizational and technological changes, as well as to new situations or contexts. - Demonstrate flexibility to understand changes. - Respect the internal procedures and rules of the organization. - Effectively implement the principle of equal treatment and non-discrimination in working conditions between women and men.
Knowledge	Contents:

	1. Electrotechnics applied to the installation of home automation and computer systems. 2. Components and characteristics of home automation and computer systems for implementation. 3. Materials, tools and equipment for the installation of home automation and computer systems. 4. Installation of cabinets, main and secondary panels, boxes for manoeuvres and derivations of home and computer systems. 5. Laying of wiring for manoeuvre, force and control of the circuits of home and computer systems. 6. Installation of equipment and devices for home and computer systems. 7. Start-up of home automation and computer systems.

Unit of competence	**MAINTAIN HOME AND BUILDING AUTOMATION SYSTEM INFRASTRUCTURE**
Expected results	General competence: to install, implement and maintain computer and communications elements in automation systems of domotic and inmotic buildings, access control and presence and video surveillance at the level of "hardware" and "software", ensuring its functionality, according to specifications and updating elements to add improvements and correct faults, under security conditions, complying with applicable environmental regulations, in matters of data protection and intellectual and industrial property, prevention of occupational risks, as well as quality standards.
Indicators	**Objectives**: Perform preventive maintenance operations in home automation and computer systems, reviewing the operating conditions of the installation and its elements, within the established deadlines and response times, according to instructions received from the person responsible for maintenance, based on technical documentation and under quality conditions, to implement the maintenance plan. Diagnose the malfunctions or breakdowns produced in the home automation and computer systems, from the symptoms detected, technical documentation of the manufacturer and history of incidents and breakdowns, meeting the times to satisfy the service level agreements, in conditions of quality and safety, following the maintenance plan for its subsequent solution. Repair malfunctions or breakdowns in home automation and computer systems, solving them according to the diagnosis and contingency situations, at the times established in the service level agreements, in conditions of quality, safety, following the maintenance plan, to perform corrective maintenance.
Capacity	- Define components and characteristics of a home automation and computer system, analysing a technical documentation for the maintenance of the same. - Apply preventive maintenance operations, among others, in a home automation and computer system, describing the process of reviewing the operating conditions of the installation and its elements, based on technical documentation and in quality conditions, to prevent and avoid failures.

	- Apply diagnostic techniques, location and repair of malfunctions or breakdowns produced in a home automation and computer system, from detected symptoms, describing procedures and tools to be used following the technical documentation of the manufacturer, in conditions of quality and safety, to restore the functionality of the system. - Finalize the work according to criteria of suitability, speed, economy and efficiency. - Demonstrate a degree of autonomy in the resolution of contingencies related to their activity. - Adapt to the organization, its organizational and technological changes, as well as to new situations or contexts. - Demonstrate flexibility to understand changes. - Respect the internal procedures and rules of the organization. - Effectively implement the principle of equal treatment and non-discrimination in working conditions between women and men.
Knowledge	Contents: 1. Electrotechnics applied to the installation of home automation and computer systems. 2. Components and characteristics of home automation and computer systems for maintenance. 3. Preventive maintenance in home automation and computer systems. 4. Corrective maintenance of home automation and computer systems.

Unit of competence	**IMPLEMENT AND MAINTAIN EQUIPMENT AND DEVICES IN HOME AND BUILDING AUTOMATION SYSTEMS**
Expected results	General competence: to install, implement and maintain computer and communications elements in automation systems of domotic and inmotic buildings, access control and presence and video surveillance at the level of "hardware" and "software", ensuring its functionality, according to specifications and updating elements to add improvements and correct faults, under security conditions, complying with applicable environmental regulations, in matters of data protection and intellectual and industrial property, prevention of occupational risks, as well as quality standards.
Indicators	**Objectives**: Implement the home automation/computer system, identifying the architecture to be installed from the technical documentation, locating and parameterizing the equipment and devices, for the commissioning of the system, complying with the functional requirements of the project and the procedures established by the entity responsible for the installation for its commissioning. Introduce changes and extensions of functionalities in home/computer systems, adapting the control “software” and configuration parameters, in accordance with technical specifications of the project and the procedures established by the entity responsible for the installation. Maintain the “hardware” and “software” of the home automation/computer system, checking functionality and solving the incidents that have arisen, to ensure that it meets the requirements and quality criteria established in the project, taking into account the

	specifications and technical manuals of the devices and equipment that make up the home automation/computer system.
Capacity	- Identify the elements that make up a home automation/computer system, interpreting the technical documentation, recognizing the location of equipment and devices and interconnections, for the implementation or modification of a system. - Apply procedures for the implementation or modification of a home automation/computer system, interpreting the technical documentation, locating and parameterizing the equipment and devices, for the commissioning of the system, fulfilling functional requirements for its commissioning. - Apply maintenance procedures for the "hardware" and "software" of a home automation/computer system, checking functionality and solving the incidents that have arisen, taking into account the specifications and technical manuals of the devices and equipment to meet requirements and criteria of quality and operability. - Finish the work according to quality and efficiency criteria. - Demonstrate a degree of autonomy in the resolution of contingencies related to their activity. - Adapt to the organization, its organizational and technological changes, as well as to new situations or contexts. - Demonstrate flexibility to understand changes. - Respect the internal procedures and rules of the organization. - Effectively implement the principle of equal treatment and non-discrimination in working conditions between women and men.
Knowledge	Contents: 1. Elements of a home automation system. 2. Implementation and updating of a home automation/computer system. 3. Maintenance of the "hardware" and "software" of a home/computer system.

Title of the course	**INSTALLATION AND MAINTENANCE OF GEOTHERMAL AND SOLAR ENERGY INSTALLATIONS APPLIED TO AIR CONDITIONING**
Expected results	To perform the assembly and maintenance of geothermal installations with hybridization of solar energy and its application to a HVAC installation.
Indicators	**Objectives**: Apply the thermodynamic principles of thermal and photovoltaic production systems, thermal loads in buildings and thermal needs according to the demand for heating, air conditioning and domestic hot water in geothermal installations. Identify the resources, catchment systems, low temperature diffusion systems and exploration techniques and components of a low enthalpy geothermal system to carry out the assembly and maintenance of a geothermal energy installation applied to heating, air conditioning and domestic hot water.

	To carry out the assembly and maintenance of solar thermal and photovoltaic installations to the air conditioning facilities.
Capacity	Learning outcomes by module: **Geothermal and solar energy**: - **Cognitive and practical knowledge/skills**: Conceptualization and characterization of energy; description of thermodynamic concepts and principles; description and identification of energy needs; organization of the assembly of geothermal equipment and its adaptation to renewable energy sources (solar thermal, solar photovoltaic). - **Managerial, personal and social skills**: Demonstration of a positive attitude for the acquisition of knowledge about the principles of thermodynamics and the theoretical application of geothermal; technical capacity for the interpretation of the different concepts involved in the organization of the assembly of a geothermal equipment; development of a proactive attitude in the resolution of problems and setbacks that may occur in geothermal installations. **Application of geothermal energy to air conditioning**: - **Cognitive and practical knowledge/skills**: Geothermal conceptualization; identification of geothermal sites and catchment systems; description and identification of the geothermal heat pump; typology of the geothermal heat pump; identification of emission systems; assembly and maintenance of a geothermal heat pump facility for domestic heating, air conditioning and domestic hot water use. - **Managerial, personal and social skills**: Use of the instruments necessary for the start-up of a domestic geothermal installation, achieving a reliable diagnosis of the operating conditions of the installation and its equipment; demonstration of a proactive attitude in solving problems and setbacks that occurred in the maintenance of geothermal installations; internal organization of the maintenance work of geothermal installations, correctly sequencing the checks, measurements and operations to be performed, in such a way that the time and resources to be used are optimized to the maximum; coordination with the team when carrying out the assembly and commissioning of geothermal installations. **Solar installations applicable to air-conditioning installations**: - **Cognitive and practical knowledge/skills**: Description of solar thermal energy; description of solar photovoltaic energy; classification of solar thermal and photovoltaic installations; identification of the situation of solar thermal energy in the EU and in Spain; classification of low temperature solar thermal equipment and installations; implementation of installation. - **Managerial, personal and social skills**: Demonstration of a proactive attitude in solving problems and setbacks in the maintenance of solar installations applicable to air conditioning; internal organization of maintenance work of solar installations, correctly sequencing the checks, measurements and operations to be performed, in such a way that the time and resources to be used are optimized to the maximum; coordination with the team when carrying out the assembly and commissioning of solar installations applicable to air conditioning.
Knowledge	Modules: Module 1. Geothermal and solar energy (15 hours)

	Module 2. Application of geothermal energy to air conditioning (15 hours) Module 3. Solar installations applicable to air-conditioning installations (20 hours)

Title of the course	**INSTALLATION OF LIGHTWEIGHT PREFABRICATED PANELS FOR INDUSTRIALISED BUILDING ENVELOPES**
Expected results	To install lightweight prefabricated panels for the realization of slabs, facades and roofs of buildings based on industrialized construction
Indicators	
Capacity	Learning outcomes by module: **Installation of lightweight prefabricated panels for industrial construction envelope**: - **Cognitive and practical knowledge/skills**: awareness of the importance of prevention at work (knowledge of the general and specific regulatory framework in preventive matters; knowledge of the mechanisms for participation, information, consultation and transfer of proposals in preventive matters; identification and understanding of the different modalities of organization of the resources necessary for the development of preventive activities by the company); basic intervention in the event of an accident (recognition of injuries and symptoms of accidents that may occur more commonly during the assembly and dismantling operations of tubular scaffolding; implementation of the PAS action protocol and the primary evaluation techniques in the event of an accident); management and interpretation of plans and technical instructions for installing light prefabricated panels; identification and differentiation of the different types of bearing structures through the technical information indicated in the plans; identification of the different uses of the panels of the technical information indicated on the drawings; carrying out auxiliary operations for the assembly of prefabricated panels for roofs (distinction of the different types of panels, screws and supporting structures for roofs; identification of the risks related to the workplace for roofs and its environment, as well as the preventive measures to be applied, distinguishing those linked to the simultaneity or succession of other activities; handling, transport and collection of loads for roofs safely, selecting the appropriate equipment and tools); assembly of prefabricated panels for roofs (planning of the phases and tasks that configure the processes of replanting, cutting, assembly, transformation and sealing of prefabricated panels on roofs from the preventive point of view; interpretation of the information collected in the indications of work procedures, assembly plans, use and in the technical instructions of the manufacturer of panels in their use on roofs; identification of the safety and health conditions that must be given to safely carry out the installation, handling and transformation of prefabricated panels, interpreting the information contained in the assembly, use and handling plans or in the manufacturer's instructions for their installation on roofs; application, within the scope of its competences, of the specific regulatory framework during the assembly and handling of prefabricated panels, differentiating which agents are involved in the process, as well as their functions, identifying the main risks and preventive measures for their control; assessment of the typology of roof-bearing structures to select and apply the different bolting techniques, obtaining appropriate stability and resistance fixations, complying with the specific safety and health measures; application of the replanting and assembly techniques to carry out the start of the installation of panels specific prefabricated roof with the alignment and placement provided according to the information contained in the assembly and use plans in the manufacturer's instructions; application of the techniques of assembly, cutting and sealing of prefabricated panels in compliance with the information contained in the assembly and use plans in the manufacturer's instructions for use on covers; safe performance of activities of supply, hoisting, cutting, sealing or removal of parts during

	the assembly of prefabricated panels according to the instructions contained in the work procedures, in the assembly, use and disassembly plans or in the manufacturer's instructions for the use of panels on the roof; interpretation of the work parts as a means of recording the progress of the tasks, including the tasks performed, the time invested, the incidents detected, etc.); performance of the auxiliary operations for the assembly of panels Prefabricated for facades (distinction of the types of panels, screws and supporting structures for facades; identification of the risks related to the workplace for facades and its environment, as well as the preventive measures to be applied, distinguishing those linked to the simultaneity or succession of other activities; handling, transport and collection of loads for facades safely, selecting the appropriate equipment and tools); assembly of prefabricated panels for facades; carrying out auxiliary operations for the assembly of prefabricated panels for forgings; assembly of prefabricated panels for forgings. - **Managerial, personal and social skills:** teamwork during the interpretation of technical plans for the assembly of light prefabricated panels; teamwork during the installation process of light prefabricated panels for roofing in industrialized buildings; teamwork during the installation process of light prefabricated panels for facades of industrialized buildings; teamwork during the installation process of light prefabricated panels for slabs of industrialized buildings.
Knowledge	Module. Installation of lightweight prefabricated panels for industrial construction envelope (40 hours)

Title of the course	**INSTALLATION AND MAINTENANCE OF ENERGY EFFICIENT GREEN ROOF SYSTEMS**
Expected results	To acquire the necessary skills in the installation and maintenance of green roof systems, in order to promote energy efficiency in buildings and sustainable construction.
Indicators	**Objectives**: Understand the fundamentals of energy efficiency in construction, its relevance in the sustainability of green roofs, and know the applicable regulations. Identify and understand the types of green roofs, their components and characteristics, and analyse their applications and advantages in various types of buildings. Develop skills in the application of advanced techniques of placement and assembly of green roof systems. Apply preventive and corrective maintenance techniques, evaluate the status of existing systems and make adjustments and repairs to ensure efficiency over time on green roofs, contributing to the care and extension of their useful life in a sustainable way.
Capacity	Learning outcomes by module: **Fundamentals of energy efficiency in buildings**: - **Cognitive and practical knowledge/skills**: Understanding the principles of energy efficiency in buildings; relationship between sustainable construction and green roofs; regulatory framework and applicable regulations. - **Managerial, personal and social skills**: Identification and application of key concepts in energy efficiency in buildings; recognition of the importance of sustainable construction in the context of green roofs; interpretation and application of relevant regulations and

	regulations in energy efficiency in buildings; ability to evaluate and communicate the economic and environmental benefits of green roofs in construction projects. **Types and characteristics of green roof systems**: - **Cognitive and practical knowledge/skills**: identification and classification of green roof types; analysis of the essential components of green roof systems; evaluation of the applications and benefits of green roofs in various building contexts. - **Managerial, personal and social skills**: Critical evaluation of information on green roof types and their applications in construction projects; efficient organization of data and resources related to green roof systems; effective communication of technical information on green roofs to other professionals and clients; adaptation to the specific needs and constraints of each construction project; decision-making based on understanding the characteristics and advantages of green roof systems; time and resources management for planning and implementing green roof projects; promotion of sustainable practices in the choice and design of green roof systems; promotion of environmental and social responsibility in decision-making related to green roofs in construction projects; establishment of collaborative relationships with other professionals and stakeholders in sustainable construction projects. **Assemblies of green roof systems**: - **Cognitive and practical knowledge/skills**: Mastery of advanced techniques of assembly of green roof systems; selection and preparation of materials and components; integration of irrigation systems and automation; application of safe practices in the assembly of green roofs. - **Managerial, personal and social skills**: Planning and efficient organization of green roof assembly projects; adaptation to unforeseen situations and decision-making in the working environment; risk assessment and application of safety measures in green roof assembly; effective communication with the work team and clients in assembly projects; management of material resources and tools in the context of green roof assembly; promotion of sustainable practices in the assembly and maintenance of green roof systems; promotion of environmental and social responsibility in sustainable construction projects; establishment of collaborative relationships with other professionals and stakeholders in green roof projects; application of ethical and professional practices in the field of green roof assembly; evaluation of the quality and effectiveness of installed green roof systems. **Corrective and preventive maintenance of green roofs:** - **Cognitive and practical knowledge/skills**: assessment of the status of existing systems; preventive and corrective maintenance techniques; adjustments and repairs to ensure efficiency over time (identification of common problems in green roof systems; knowledge of appropriate adjustment and repair techniques; ability to make adjustments and repairs effectively and safely). - **Managerial, personal and social skills**: Efficient planning of preventive and corrective maintenance programs on green roofs; proactively identifying and solving problems in maintenance projects; effective communication with owners or managers of green roofs; supervision and coordination of work teams in maintenance activities; management of material resources and tools in the context of green roof maintenance; promotion of

	sustainable practices in the maintenance of green roof systems; promotion of environmental and social responsibility in maintenance projects; establishment of collaborative relationships with other professionals and stakeholders in green roof projects; application of ethical and professional practices in the field of green roof maintenance; evaluation of the quality and effectiveness of the maintenance activities carried out.
Knowledge	Modules: Module 1. Fundamentals of energy efficiency in buildings (20 hours) Module 2. Types and characteristics of green roof systems (30 hours). Module 3. Assemblies of green roof systems (50 hours). Module 4. Corrective and preventive maintenance of green roofs (50 hours)

Title of the course	**INTRODUCTION TO GREEN ROOFS AND THEIR IMPACT ON ENERGY EFFICIENCY**
Expected results	To acquire basic knowledge about green roofs and their impact on energy efficiency, understanding their relevance in reducing energy consumption and their contribution to environmental sustainability.
Indicators	**Objectives**: Understand the fundamental characteristics of green roofs and understand their importance in promoting energy efficiency in the contemporary context. Identify and understand the ecological and energy benefits that green roofs bring to buildings and the environment, assessing their impact on reducing energy consumption and improving environmental well-being. Identify and differentiate the different types of green roofs and their essential components, understanding their function and relevance in energy efficiency.
Capacity	Learning outcomes by module: **Introduction to energy efficiency through green roofs**: - **Cognitive and practical knowledge/skills**: concept and essence of green roofs; importance of green roofs in the current context (impact on energy efficiency; direct environmental benefits; real cases of implementation and their relevance); first steps towards sustainability. - **Managerial, personal and social skills**: Active understanding of the basic concepts related to green roofs and their impact on energy efficiency; practical application of the knowledge acquired in everyday situations to promote energy efficiency; critical analysis of different types of buildings and their potential for the implementation of green roofs; effective communication of the benefits and advantages of green roofs to different audiences, from neighbours to professionals in the sector; informed decision-making on the implementation and promotion of green roofs in different contexts; adaptability to new developments and trends in the field of green roofs and energy efficiency; constructive collaboration with other professionals and enthusiasts in green roofs-related projects; ethical responsibility in the promotion and application of sustainable and environmentally friendly practices; autonomy in the search for additional information and updates on green roofs and energy efficiency; time management for the planning and execution of green roofs-related projects or activities.

	Energy benefits of green roofs: - **Cognitive and practical knowledge/skills**: recognition of the ecological benefits of green roofs; assessment of the energy benefits of green roofs; understanding the relationship between green roofs and sustainability; identification of plant types and their role in energy efficiency. - **Managerial, personal and social skills**: Critical assessment of ecological solutions in the field of construction; environmental commitment in the choice and promotion of sustainable solutions; effective communication of the benefits of green roofs to different audiences; informed decision making on the implementation of green roofs in projects; adaptability to new trends and technologies in energy efficiency; active collaboration in multidisciplinary teams focused on sustainability; responsible management of resources and materials in green roofs projects; social sensitivity to the needs of communities in terms of sustainability and well-being; proactive initiative in the search for innovative solutions in energy efficiency; respect and consideration for the opinions and perspectives of others in the field of sustainable construction. **Basic types and components that ensure energy efficiency through green roofs**: - **Cognitive and practical knowledge/skills**: differentiation between types of green roofs; recognition of basic components of green roofs, practical application of knowledge. - **Managerial, personal and social skills**: Identification of suitable components and materials for different types of green roofs; analysis of real examples to determine the energy efficiency of different types of roofs; clear communication of the advantages and disadvantages of different types of green roofs; initiative to search and learn about the latest trends and advances in green roofs; respect for regulations and standards related to sustainable construction; autonomy in decision-making based on the information and knowledge acquired; empathy and sensitivity to the needs of the environment and the community in the implementation of sustainable solutions
Knowledge	Modules: Module 1. Introduction to energy efficiency through green roofs (20 hours) Module 2. Energy benefits of green roofs (20 hours) Module 3. Basic types and components that ensure energy efficiency through green roofs (30 hours).

Title of the course	**BASIC PROCEDURES IN GREEN ROOF INSTALLATION**
Expected results	To provide participants with the fundamental knowledge and skills necessary to perform auxiliary tasks in the assembly of green roofs, vegetable roofs or vegetable roofs.
Indicators	**Objectives**: Understand the fundamentals of green roofs and their impact on energy efficiency and the environment. Acquire practical skills in the handling of tools and knowledge about the materials necessary for the assembly of green covers.

	Develop skills in the application of basic techniques of placement and assembly of green roof systems. Know and apply the basic safety standards during the assembly process of green covers.
Capacity	Learning outcomes by module: **Introduction to green roofs and energy efficiency**: - **Cognitive and practical knowledge/skills**: Understanding green roofs; linking green roofs and energy efficiency; assessing environmental benefits. - **Managerial, personal and social skills**: ecological learning management; deep ecological understanding; collaboration for sustainability; effective environmental communication; ecological responsibility; sustainability innovation; adaptation to environmental change; biodiversity assessment. **Basic tools and materials for mounting green covers**: - **Cognitive and practical knowledge/skills**: handling of basic tools; selection of suitable materials. - **Managerial, personal and social skills**: Coordination and planning of practical tasks in the management of tools and selection of materials, optimizing the time and resources available in the context of green roof assembly; conscious and safe use of basic tools, applying safety and risk prevention standards in the working environment of green roofs; judicious and responsible choice of ecological and sustainable materials, assessing their environmental impact and their adaptation to the green roof project; active and constructive contribution in group activities, encouraging teamwork and effective communication in practical situations of green roof assembly; flexibility and openness to adapt to different environments and work situations in the field of green roofs, showing respect and consideration for the diversity of opinions and approaches; proactive attitude and committed to promoting sustainable and ecological practices in the process of green roof assembly, showing environmental responsibility; identification and effective solution of problems and challenges that arise during the handling of tools and materials in the context of green roofs; clear and accurate articulation of ideas, instructions and feedback in the green roofs assembly work environment, facilitating understanding and information exchange among team members. **Elementary green roof placement techniques**: - **Cognitive and practical knowledge/skills**: familiarization with placement processes; assistance in assembly practices; basic handling of tools and materials; support in solving basic problems during placement; adherence to basic safety standards. - **Managerial, personal and social skills**: active and constructive contribution in group tasks, facilitating the achievement of common objectives in the assembly of green roofs; exchange of information and opinions in a clear, concise and respectful way, promoting a harmonious work environment during the placement process; adjustment and compliance with established guidelines and procedures, showing flexibility and willingness to learn during the assembly of green roofs; maintaining calm and focus on situations of stress or pressure, seeking practical and effective solutions during the placement of green roofs systems; diligent and responsible compliance with the assigned tasks, showing commitment and dedication in learning and assistance during the assembly; promotion and adherence to safe

	work practices, contributing to the prevention of accidents and occupational risks in the environment of green roofing; recognition and valuation of individual differences, promoting an inclusive and respectful environment during the pro-activity assembly process; In the identification and resolution of minor inconveniences, collaborating in the continuous improvement of the process of placing green covers; responsible conservation of the resources and tools assigned, ensuring their correct functioning and durability in the assembly process; constant search for learning and improvement of skills, showing willingness to acquire new knowledge and techniques in the placement of green covers. **Basic safety standards for the assembly of green covers:** - **Cognitive and practical knowledge/skills**: understanding of safety regulations; implementation of preventive measures, adoption of protective measures; promotion of safe working environments. - **Managerial, personal and social skills**: Promotion of safe and responsible practices among the team during the assembly process of green covers; clear and accurate transmission of danger situations and preventive measures to colleagues and supervisors in the work environment; active and cooperative participation in the identification and mitigation of unsafe conditions at the assembly site; rapid and effective adjustment to the safety regulations and procedures established in the green covers project; conscious and appropriate management of individual and collective protection equipment to prevent occupational accidents; cultivation of a mentality oriented to the prevention of occupational risks and the protection of one's own well-being and that of others in the work environment; maintenance of calm and making sound decisions under pressure in cases of incidents or emergencies during assembly; observance and compliance with labour laws and regulations in relation to safety at work; regulation of emotions and behaviours in situations of tension or conflict in the workplace assembly site; Proactive search and acquisition of new knowledge and skills in occupational safety and risk prevention.
Knowledge	Modules: Module 1. Introduction to green roofs and energy efficiency (50 hours) Module 2. Basic tools and materials for mounting green covers (50 hours). Module 3. Elementary green roof placement techniques (50 hours). Module 4. Basic safety standards for the assembly of green covers (50 hours)

Title of the course	**SAFETY AND TECHNIQUES FOR WORKING AT HEIGHT**
Expected results	Safely perform work at height complying with the regulatory requirements of R.D. 2177/2004, R.D. 1215/1997 and R.D.773/1997, required in terms of quality and prevention of occupational risks.
Indicators	**Objectives**: Thoroughly review personal protective equipment (PPE) and carry out the corresponding annual inspections required by manufacturers and national regulations. Identify the main characteristics of the different lifeline models, as well as their use and assembly.

	Appropriate application of procedures and techniques for rope access and positioning in vertical work.
Capacity	Learning outcomes by module: **Review of personal protective equipment working at height**: - **Cognitive and practical knowledge/skills**: explanation of the care, maintenance and verification of work and safety equipment (applicable legislation RD 2177/2004, RD 773/1997 and RD 1215/1997: basic safety concepts: PPE personal protective equipment and risks associated with the use of these equipment against fall at height; shock force, fall factor and safety factor; fall control systems according to A 363; check control; registration cards; maintenance of personal protective equipment; sites for the corresponding inspections; record management; recording of the follow-ups performed; records for audits; verification of the follow-up of management systems; responsibility planning; employer; competent technician) practical application of the selection, attachment and handling of work and safety equipment (positioning; visual check; adjustments of PPE/equipment; use of fall arresters for ropes). - **Managerial, personal and social skills**: strict compliance; coordination to perform repetitive tasks; responsibility for rigorous inspections of work and safety equipment. **Use and assembly of lifelines**: - **Cognitive and practical knowledge/skills**: Description of the techniques of use and assembly of the lifelines; practical application of the working system in descents and ascents through vertical line ropes and line changes. - **Managerial, personal and social skills**: strict compliance with regulations; responsibility for rigorous inspections of work and safety equipment. **Procedures and techniques in vertical work**: - **Cognitive and practical knowledge/skills**: description of procedures and techniques; practical application of the procedures described. - **Managerial, personal and social skills**: rigor in the performance of tasks; self-criticism for the acceptance and correction of errors; responsibility for rigorous inspections of work and safety equipment; cooperation and teamwork.
Knowledge	Modules: Module 1. Review of personal protective equipment working at height (8 hours) Module 2. Use and assembly of lifelines (8 hours). Module 3. Procedures and techniques in vertical work (24 hours).

Title of the course	**PREVENTION OF OCCUPATIONAL RISKS FOR THE LAYING OF ROOFING MATERIALS**
Expected results	To acquire training in occupational risk prevention in the construction sector in accordance with the training program of second cycle by trade for placement of covering materials of the current General Agreement of the Construction Sector.

Indicators	N/A
Capacity	Learning outcomes by module: **Occupational Risk Prevention for work on laying of cover materials**: - **Cognitive and practical knowledge/skills**: COMMON PART. 1. Preventive techniques (means of collective protection; personal protective equipment; signalling); 2. Auxiliary means, equipment and tools commonly used on construction sites; 3. Verification, identification and monitoring of the workplace and its environment (general risks on construction sites; knowledge of the workplace environment). Planning of tasks from a preventive point of view; handling of chemicals. Safety data sheets. Symbology); 4. Interference between activities (simultaneous and successive activities); 5. Rights and obligations (General and specific regulatory framework; organization of occupational risk prevention; participation, information, consultation, and proposals; operational and legal compliance). General concepts, responsibilities and channels of consultation); 6. First aid and emergency measures. SPECIFIC PART 1. Definition of works (types of roofing; Coating materials: tiles, slate, steel or light alloy sheets or panels, synthetic plates, etc.; laying and fastening systems); 2. Specific preventive techniques (risk identification; post risk assessment; auxiliary equipment, work equipment and tools: risks and preventive measures; manual handling of loads; collective protection means (placement, uses, obligations and maintenance); personal protection equipment (placement, uses, obligations and maintenance); materials and products (labelling, safety data sheets, H and P phrases...). - **Managerial, personal and social skills**: management skills, personal and social, that are necessary for the achievement of the above learning outcomes will be addressed. **Linkages with professional training**: This training allows, together with the fulfilment of the additional requirements established in the General Agreement of the Construction Sector, to apply for the Construction Professional Card (TPC)
Knowledge	Module. Occupational Risk Prevention for work on laying of cover materials (20 hours)

Title of the course	**PREVENTION OF OCCUPATIONAL RISKS FOR THE LAYING OF ROOFING MATERIALS. SPECIFIC PART**
Expected results	To acquire training in occupational risk prevention in the construction sector in accordance with the training program of second cycle by trade for placement of covering materials (specific part) in accordance with the requirements of the current General Convention of the Construction Sector.
Indicators	N/A
Capacity	Learning outcomes by module: **Occupational Risk Prevention for work on laying covering materials. Specific part**: - **Cognitive and practical knowledge/skills**: 1. Definition of work (types of roofing; covering materials: tiles, slate, steel or light alloy sheets or panels, synthetic plates, etc.; laying and fastening systems); 2. Specific preventive techniques (risk identification; post risk assessment; auxiliary equipment, work equipment and tools: risks and preventive measures; manual handling of loads; collective protection means (placement, uses, obligations and

	maintenance); personal protection equipment (placement, uses, obligations and maintenance); materials and products (labelling, safety data sheets, H and P phrases...). - **Managerial, personal and social skills:** Management skills, personal and social, that are necessary for the achievement of the above learning outcomes will be addressed. **Linkages with professional training**: This training allows, together with the fulfilment of the additional requirements established in the General Agreement of the Construction Sector, to apply for the Construction Professional Card (TPC)
Knowledge	Module. Occupational Risk Prevention for work on laying covering materials. Specific part (6 hours)

Title of the course	**BASIC PARTICIPATORY DRY CONSTRUCTION OPERATIONS**
Expected results	To carry out basic operations of prefabrication and dry assembly in participatory constructions according to technical indications and specifications of the project; applying, in conditions of safety, occupational health and care, constructive techniques based on the reversibility of the building and the incorporation of second-hand material, recovered and reused, in coordination with the agents involved for the transition towards a circular economy. Includes training methodology for organizing untrained or functionally different teams.
Indicators	**Objectives**: Integrate the foundations of the participatory dry construction project from the analysis of previous reference experiences. Recognize the procedures for the execution of dry constructions, correctly interpreting the technical documentation of the project, the characteristics of the materials and construction systems; as well as the tools and protective equipment to be used in the prefabrication and assembly of the material according to the necessary safety conditions. Promote the conditions of safety, occupational health and care that are required in the different phases of the participatory construction process, identifying the risks, prevention systems, basic first aid techniques and personal and collective protection equipment necessary, as well as promoting the creation of a work environment of care and mutual help. Perform prefabrication operations of modular light-frame structures, according to the specifications of the technical project; the recognition and proper use of materials and tools; and the safety, occupational health and care conditions in participatory construction works. Perform redesign and assembly operations of prefabricated elements of dry constructions, according to the specifications of the technical project; the recognition and proper use of materials and tools; execution of redesign and assembly operations of reversible foundations, modular and light-framed metal structures, insulation and waterproofing, roofing, carpentry, exterior and interior coverings, and urbanization of the plot.
Capacity	Learning outcomes by module: **Fundamentals of participatory dry construction**: - **Cognitive and practical knowledge/skills**: Analysis of the foundations of participatory construction (identification of the needs to which the project responds to; applicable

	regulatory framework; methodology for the inclusion of community agents in the construction process); analysis of the foundations of dry construction (circular economy and reversibility of the building; applicable regulatory framework; incorporation of second-hand materials, recovered and reused). - **Managerial, personal and social skills**: ability to problematise the shortcomings and difficulties encountered in the construction sector in order to exercise the profession with commitment and responsibility; appreciation of dry construction as a strategy to facilitate the reversibility of the building and enable the execution of works in complex urban and/or social contexts; awareness of the importance of incorporating second-hand, recovered and reused materials in construction for the transition towards a circular economy. **Dry construction techniques, materials and tools**: - **Cognitive and practical knowledge/skills**: interpretation of the technical documentation included in the project (axonometric representation systems and perspectives; planimetry: plans, elevations, sections and construction details; workshop plans and assembly sheets); recognition of materials and dry construction systems (reversible foundations, modular and light-framed metallic structures, insulation and waterproofing, roofing, carpentry, exterior and interior cladding, plot development); recognition and proper use of tools and equipment (portable and manual tools, individual and collective protection equipment); logistics of reception, stockpiling and transport of material (reception, location and stockpiling of materials on the site; considerations for the handling, transport of material and setting up on site). - **Managerial, personal and social skills**: Ability to interpret the planimetry of a dry construction project for its subsequent execution; understanding of the functioning of materials, tools and construction systems used in dry construction; ability to organise the reception, collection, transport and installation of material on the construction site. **Safety, occupational health and care conditions**: - **Cognitive and practical knowledge/skills**: definition of the concept of occupational safety and health; working under safe and healthy working conditions in dry construction; promotion of caring and mutually supportive working environments. - **Managerial, personal and social skills**: understanding of the concepts of safety, occupational health and care; awareness of the importance of fostering a safe, caring and mutually supportive work environment; communication skills, active listening, assertiveness and empathy in dealing with conflict and positive interdependence with the team; skills in organising work environments for risk prevention; appreciation of participatory construction as a possibility for personal and professional development; as well as a tool for fostering the participation and inclusion of groups with special integration difficulties. **Modular construction and prefabrication**: - **Cognitive and practical knowledge/skills**: identification of the prefabrication operations to be carried out according to the specifications of the technical project; preparation of the workshop space and prevention of equipment, tools and individual and collective protection equipment; execution of measuring, cutting and assembly operations of prefabricated light-framed floor slab modules, light-framed structural walls, wooden trusses, light-framed roof

	slabs, joinery and special construction elements; transport and stockpiling of prefabricated modules on the construction site. - **Managerial, personal and social skills**: motivation to achieve objectives and to learn from common problems; skills in planning and coordination of team tasks for the prefabrication of light-frame modular structures; communication skills, active listening, assertiveness and empathy in dealing with conflict and positive interdependence with the team; ability to work in coordination with various actors in the achievement of common sustainable development objectives. **Dry construction assembly**: - **Cognitive and practical knowledge/skills**: identification of the assembly operations to be carried out according to the specifications of the technical project; preparation of the workshop space and prevention of tools, tools and individual and collective protection equipment. - **Managerial, personal and social skills**: motivation to achieve objectives and to learn from common problems; skills in planning and coordination of team tasks for the assembly of dry construction; ability to encourage the incorporation of second-hand, salvaged and reused materials in construction; ability to work in coordination with various actors in the achievement of common sustainable development objectives.
Knowledge	Modules: Module 1. Fundamentals of participatory dry construction (10 hours) Module 2. Dry construction techniques, materials and tools (60 hours) Module 3. Safety, occupational health and care conditions (20 hours) Module 4. Modular construction and prefabrication (60 hours) Module 5. Dry construction assembly (180 hours)

Title of the course	**BASIC PROCEDURES FOR EFFICIENT CURTAIN WALL INSTALLATION**
Expected results	To acquire basic skills to efficiently assist in the installation of curtain walls, with emphasis on energy efficiency and safety.
Indicators	**Objectives**: Acquire fundamental knowledge of curtain walls and their impact on energy efficiency. Identify and safely use the basic materials and tools necessary to efficiently assist in the installation of curtain walls. Apply appropriate techniques and procedures to efficiently assist in the installation of curtain walls, ensuring safety and minimising risks during the process.
Capacity	Learning outcomes by module: **Fundamentals of curtain walls and energy efficiency**: - **Cognitive and practical knowledge/skills**: curtain wall understandings; the basis for energy efficiency. - **Managerial, personal and social skills**: attention and understanding of the information and concepts transmitted during the theoretical sessions on curtain walls and energy efficiency; contribution of ideas, opinions and questions related to the topics covered, favouring a collaborative learning environment; planning and management of the time and resources available for the study and understanding of the contents of the module; critical evaluation of the knowledge acquired on curtain walls and energy efficiency and its application in practical contexts; fostering a respectful and mutually supportive environment, facilitating the exchange of knowledge and experiences among participants; acceptance and assimilation of new concepts and perspectives on sustainable and efficient construction; recognition of the diversity of thoughts and experiences in the group, promoting enriching and pluralistic learning; clear and concise expression of thoughts and knowledge on the topics studied, using appropriate and respectful language. **Materials and tools for curtain wall assembly assistance**: - **Cognitive and practical knowledge/skills**: safe handling of tools and materials (distinction between different tools and materials common in the assembly of curtain walls; application of appropriate techniques for the use and handling of basic tools, avoiding risks and maximising efficiency; integration of correct procedures in the handling of materials, considering their properties and characteristics); application of safety protocols (interpretation and monitoring of safety protocols and procedures during the handling of tools and materials; identification of risks and application of preventive measures associated with each tool and material used); application of safety protocols (interpretation and monitoring of safety protocols and procedures during the handling of tools and materials; identification of risks and application of preventive measures associated with each tool and material used). - **Managerial, personal and social skills**: sustaining attention and responsibility when handling different materials and tools, applying acquired knowledge to avoid accidents and optimise resources; developing cooperation and effective communication with other professionals in the assembly process, contributing to a positive and productive work environment; effective management of time and resources, coordinating the preparation and use of necessary materials and tools, and proactively solving possible inconveniences;

	internalisation and conscious application of safety regulations and procedures, to promote a safe and standard-compliant work environment; effective and clear transmission of information, instructions and feedback in the work context, minimising misunderstandings and errors; valuing and complying with established protocols and regulations, understanding their importance for the common welfare in the work environment; fostering an atmosphere of respect and collaboration between colleagues and superiors, cultivating harmonious and constructive working relationships; actively seeking and willingness for continuous learning and improvement in the handling of materials and tools, and acquiring new knowledge and skills. **Curtain wall installation assistance**: - **Cognitive and practical knowledge/skills**: assistance in the installation of curtain walls; handling of safety measures; communication and coordination during assembly; proper use of tools and auxiliary equipment. - **Managerial, personal and social skills**: smooth communication during curtain wall installation; identifying and dealing with obstacles during assembly assistance; adjusting to the time and pace demands of the assembly team; managing stress in situations of high demand or unforeseen placement events; promoting a collaborative environment with assemblers and other assistants; attention to detail when handing tools and materials to assemblers; anticipating assembly team needs for smooth operation; respecting and observing specific safety measures in the work environment; active listening to understand specific instructions and act accordingly.
Knowledge	Modules: Module 1. Fundamentals of curtain walls and energy efficiency (30 hours) Module 2. Materials and tools for curtain wall assembly assistance (30 hours). Module 3. Curtain wall installation assistance (50 hours).

Title of the course	**NEW SUSTAINABLE BUILDING MATERIALS**
Expected results	To acquire knowledge about sustainable building materials, their characteristics and different uses.
Indicators	**Objectives**: Internalise the characteristics and determining factors that make a material sustainable for construction, such as durability, usability or recyclability at the end of its useful life. Identify and characterise the main sustainable materials that can be used today in building and refurbishment, going deeper into their characteristics and possibilities of use and differentiating between the evolution towards sustainability of traditional materials and the new, more innovative materials that exist or are expected to spread in the market.
Capacity	Learning outcomes by module: **Introduction to sustainable and green building**: - **Cognitive and practical knowledge/skills:** assessment of the sustainability of materials; understanding the importance of sustainability in building and retrofitting; identification of

	characteristics and evaluation of new materials: measurement of environmental impact (durability; repairability; recyclability; insulating capacity and other characteristics). - **Managerial, personal and social skills**: commitment to carry out work activities, based on sustainability coordinates and requirements, with interest and motivation; ability to solve problems respecting sustainability protocols and requirements; awareness to transmit in the work context the importance of sustainability in building and renovation. **New sustainable materials and their uses**: - **Cognitive and practical knowledge/skills**: knowledge of the evolution and presence of traditional materials in construction as well as of new materials that are positioned as innovative and with high utility potential in building and construction; knowledge of the impact on the environment of the procurement, transformation, use and end of life of traditional materials in construction as well as of new materials that are positioned as innovative and with high utility potential in building and construction; analysis and understanding of the technical characteristics (durability, repairability, recyclability) of traditional building materials as well as new materials that are positioned as innovative and with high potential for use in building and construction; identification of the different and most common uses of traditional building materials in building and renovation. - **Managerial, personal and social skills**: commitment to develop work activities taking into consideration the precepts of sustainability; awareness to solve problems respecting sustainability protocols and requirements in the handling of materials; ability to transmit in the work context the importance of sustainability in building and renovation.
Knowledge	Modules: Module 1. Introduction to sustainable and green building (5 hours) Module 2. New sustainable materials and their uses (15 hours)

Title of the course	**FUNDAMENTALS OF MASONRY WORK FOR CONSTRUCTION 4.0**
Expected results	To acquire theoretical knowledge about the main changes that construction 4.0 is bringing about in the traditional masonry trade from two perspectives: the digital tools used in construction processes and the role of masonry in industrialised construction.
Indicators	**Objectives**: Knowing the role of masonry within the industrialised construction process. Acquire the basic digital skills that allow working with the main computer tools used in masonry work, especially those related to the use of hardware and collaborative software programmes.
Capacity	Learning outcomes by module: **Masonry in industrialised construction**: - **Cognitive and practical knowledge/skills:** understanding of the role of masonry in industrialised construction (relevance of assembly tasks and new work planning); understanding of trends in construction: industrialised construction (e.g. partition kits); introduction to new building envelope systems in new construction and in renovation).

	- **Managerial, personal and social skills**: awareness to develop analytical skills to identify and propose solutions in masonry; ability to identify problems that can be solved by means of industrialised masonry. **Digital competences for masonry in construction 4.0**: - **Cognitive and practical knowledge/skills**: handling of hardware used in building (tablets, mobile phones, other hardware tools); understanding of BIM methodology for masonry (what is BIM; BIM in the different phases of the project; BIM for masonry workers: reading plans, measurements, information sharing, etc.); handling of software used in building: REVIT (general aspects of using REVIT software; REVIT viewers; management of workflows and different modules; practical uses of REVIT; cost measurements, etc.); BIM for masonry workers: reading plans, measurements, information sharing, etc.); handling of software used in building: REVIT (general aspects of using REVIT software; REVIT viewers; management of workflows and different modules; practical uses of REVIT; cost measurements, etc.). - **Managerial, personal and social skills**: awareness to develop analytical skills to identify and propose masonry solutions using BIM methodology; ability to select and optimise digital tools to facilitate masonry work; ability to work collaboratively using digital tools; commitment to teamwork.
Knowledge	Modules: Module 1 Masonry in industrialised construction (5 hours) Module 2. Digital competences for masonry in construction 4.0 (30 hours)

Title of the course	**PREVENTION OF OCCUPATIONAL RISKS FOR MASONRY WORKS**
Expected results	To acquire training in occupational risk prevention in the construction sector in accordance with the second cycle training programme by trade for bricklayers of the current General Agreement for the Construction Sector.
Indicators	N/A
Capacity	Learning outcomes by module: **Prevention of Occupational Risks for masonry works**: - **Cognitive and practical knowledge/skills:** COMMON PART. Preventive techniques (collective protection means; individual protection equipment; signposting); auxiliary means, equipment and tools commonly used on construction sites; verification, identification and monitoring of the workplace and its environment (general risks on construction sites; knowledge of the workplace environment. Planning of tasks from a preventive point of view; handling of chemical products. Safety data sheet. Symbology); interference between activities (simultaneous or successive activities); rights and obligations (General and specific regulatory framework. Organisation of occupational risk prevention. Participation, information, consultation and proposals. Operational and legal compliance. General concepts, responsibilities and consultation channels), first aid and emergency measures. SPECIFIC PART. Definition of the work (façades (brickwork and cement cladding); interior layout (partition walls); materials (ceramic, plasterboard, plaster...); specific preventive techniques (identification of risks; risk assessment of the job (generic); auxiliary means:

	scaffolding, work platforms; work equipment and tools: risks and preventive measures; manual handling of loads; collective protection means (placement, uses, obligations and maintenance); individual protection equipment (placement, uses, obligations and maintenance). - **Managerial, personal and social skills**: management, personal and social skills, which are necessary for the achievement of the above learning outcomes, will be addressed. **Linkages with professional training**: This training allows, together with the fulfilment of the additional requirements established in the General Agreement of the Construction Sector, to apply for the Construction Professional Card (TPC)
Knowledge	Module. Prevention of Occupational Risks for masonry works (20 hours)

Title of the course	**PREVENTION OF OCCUPATIONAL RISKS FOR MASONRY WORKS. SPECIFIC PART**
Expected results	To acquire training in occupational risk prevention in the construction sector in accordance with the second cycle training programme by trade for bricklayers (specific part) in accordance with the requirements of the current General Agreement for the Construction Sector.
Indicators	N/A
Capacity	Learning outcomes by module: **Prevention of Occupational Risks for masonry Works. Specific part**: - **Cognitive and practical knowledge/skills:**)); specific preventive techniques (identification of risks; risk assessment of the job (generic); auxiliary means: scaffolding, work platforms; work equipment and tools: risks and preventive measures; manual handling of loads; collective protection means (placement, uses, obligations and maintenance); individual protection equipment (placement, uses, obligations and maintenance); materials and products (labelling, safety data sheets, H and P phrases, etc.). - **Managerial, personal and social skills**: management, personal and social skills, which are necessary for the achievement of the above learning outcomes, will be addressed.
Knowledge	Module. Prevention of Occupational Risks for masonry works. Specific part (6 hours)

Title of the course	**SAFETY IN TEMPORARY WORK AT HEIGHT: ESSENTIAL REQUIREMENTS, EQUIPMENT AND TECHNIQUES**
Expected results	To acquire the fundamental knowledge of the regulatory requirements, technical aspects, types of work equipment and means of protection (collective and individual), as well as the procedures and conditions of safe use, which allow planning and tackling, with the appropriate levels of safety, the temporary work at height that is most frequently carried out on a construction site (except for vertical work). **Specific objectives**:

	- Identify the specific work equipment (MEWPs, mobile work towers, tubular service scaffolding, ladders) and the collective and individual means of protection designed, manufactured and marketed for the correct performance of temporary work at heights. - Know the regulatory requirements included in the different mandatory provisions (e.g. Law 31 PRL, R.D. 1627:1997, R.D. 1215:1997 and modification R.D. 2177:2004, R.D. 486:1997...), for the correct performance and planning of work at heights. - Interpret and put into practice the instructions contained in the manuals of the manufacturers of collective protection means and individual protection equipment. - Know the conditions of safe use of the different means of protection (collective, individual). - Differentiate between the different devices and components that make up a fall arrest system in order to select those that are compatible with each other. - Identify the information that must be permanently marked on the different equipment and means of protection used for work at height. - Know and, where appropriate, safely handle the different existing safety equipment and means (collective and personal, including PPE against falls from height), as well as their use and applications in the different types of work environments. - Acquire awareness of the importance of using means and equipment correctly and with special attention to safety regulations. - Master the generic and specific positioning and securing manoeuvres necessary to safely carry out the work at height that is most frequently carried out on a construction site (except vertical work). - Know the basic guidelines for action in the case of rescue of an injured person by falling on a collective protection system (e.g. safety nets) and in the case of an injured person suspended from an anchorage device and fall arrest harness. - Show social teamwork skills and attitudes in the development of learning activities. Increase the level of professional competence. - Integrate into any work team safely and efficiently.
Indicators	N/A
Capacity	N/A
Knowledge	**Content**: Didactic Unit 1. Introduction. Regulatory requirements and fundamental concepts for the development of temporary work at height. 1.1. Fundamental requirements in the mandatory provisions (Law 31/1995 on PRL, R.D. 1627/97, CGSC, R.D. 1215/97 and modification through R.D. 2177/04, R.D. 486/97). 1.2. Identification of construction phases with special risk of falling from height (e.g. excavation, structure, façade/finishing, roofing). 1.3. Identification of specific work equipment (MEWPs, mobile work towers, tubular service scaffolding, ladders), and collective and individual means of protection. 1.4 Criteria for the correct planning of temporary work at height.

	Didactic Unit 2. Collective means of protection against falls from a height: description, technical requirements and conditions for safe use. 2.1. Description and basic technical characteristics of safety net systems, and edge protection systems. 2.2. Basic assembly procedures for safety net systems according to type of construction and stage of construction. 2.3. Conditions for the maintenance of collective means of protection. Didactic Unit 3. Personal protective equipment to prevent falls from a height: description, technical requirements and safe conditions of use. 3.1. Essential health and safety requirements, specific additional requirements and safe conditions of use of PPE against falls from a height, in accordance with the mandatory provisions (EU Regulation 2016/425, R.D. 773/97). 3.2. Description of types of PPE for temporary work at height. Fall arrest systems and their components; fall arrest harness, anchorage devices, connectors, energy absorbers/dissipaters, lanyards, retractable devices. 3.3. Technical and safe use requirements for the main fall arrest devices/systems: fall arrest harness, anchorage devices (structural anchors, flexible and rigid, horizontal and vertical anchor lines). 3.4. Conformity assessment (CE marking) and minimum information on marking and labelling of fall protection PPE. 3.5. Safe maintenance and upkeep of fall protection PPE 3.6. 3.6. Basic positioning techniques at the work point. Differences between gripping, holding and positioning devices at the work point. Fall factor. 3.7. Suspension trauma or harness syndrome, preventive measures, and technical rescue preparation. Didactic Unit 4. Emergency response and evacuation. 4.1 Falling onto a collective protection system (e.g. safety nets). 4.2 Rescue equipment and techniques in the event of an injured person suspended from an anchor device and fall arrest harness.

Title of the course	**PRECAST CONCRETE FITTER**
Expected results	To acquire basic knowledge for the assembly of precast concrete parts, which allow them to identify different precast parts, as well as perform the different assembly work within a small working group.
Indicators	N/A
Capacity	N/A
Knowledge	**Theoretical content**: Didactic Unit 1. Precast concrete construction - general description. 1.1. Introduction to prefabricated concrete. 1.2. Applications, advantages and disadvantages.

	1.3. Manufacturing process, transport and installation. 1.4. General description of systems. 1.5. Phases of execution. Didactic Unit 2. Tools and equipment in the assembly of precast concrete products. 2.1. Safety equipment. Auxiliary means. 2.2. Lifting equipment. Types and accessories. Lifting techniques. 2.3. Hand tools. Description and use. 2.4. Tool selection and handling exercises. Didactic Unit 3. Erection of precast concrete columns. 3.1. General concepts of column installation. 3.2. Types of assembly used. Characteristics and particularities of each type. 3.3. Assembly sequence. 3.4. Exercises on the interpretation of erection and layout plans. Didactic Unit 4. Erection of precast concrete beams and hollow core slabs. 4.1. General concepts of the installation of beams and slabs. 4.2. Types of beams. Fixing methods. Types of supports. Auxiliary elements. 4.3. Assembly of hollow core slabs. 4.4. Auxiliary elements, accessories. 4.5. Assembly sequence. Subsequent operations. 4.6. Exercises on the interpretation of assembly drawings, layout and selection of elements and tools. Didactic Unit 5. Assembly of precast concrete deck systems and precast concrete elements. 5.1. General concepts of the formation of decks with precast concrete elements. 5.2. Precast concrete deck elements. Beams (delta, load bearing, gutter), joists, tubular... 5.3. Fixing methods of the different elements. Supports. Auxiliary elements. Details. 5.4. Assembly sequence. Auxiliary means. 5.5. Exercises on the interpretation of assembly plans, staking out and selection of elements and tools. Didactic Unit 6. Assembly of prefabricated panels for façades. 6.1. Types of panels. Characteristics and range of use. 6.2. Support structures according to formats. Fixing systems. 6.3. Lifting and positioning techniques. 6.4. Assembly sequence. Checks. Adjustment, support and levelling. 6.5. Final operations Anchorage protection. Sealing of panels. 6.6. Exercises in the interpretation of assembly plans, setting out and selection of elements and tools. Sealing practices. Didactic Unit 7. Basic notions of organisation and planning in the erection of precast concrete elements 7.1. General organisation of the site. Adaptation to the safety plan, delimitation...

	7.2. Reception of materials, stockpile management, storage and waste. 7.3. Assembly team. Roles and functions. 7.4. Machinery, auxiliary means, equipment. 7.5. Coordination with other trades and simultaneous work. 7.6. Production cycle: design, planning, manufacture, transport and commissioning. 7.7. Coordination of assembly with the complete production cycle. 7.8. Verification and quality control. 7.9. Interpretation of assembly drawings. Use of computer media to consult and share information. 7.10. Exercises in the interpretation of assembly plans with foresight of means and equipment. Exercises on handling information on mobile devices. Didactic Unit 8. Mock-up assembly with the usual prefabricated concrete construction systems 8.1. Mounting pillars and beams 8.2. Mounting covered structure 8.3. Mounting panels 8.4. Sealing panels and other final operations. **Practical content**: Didactic Unit 1. Prefabricated construction with concrete overview. 1.1. Introduction to precast concrete. 1.2. Applications, advantages and disadvantages. 1.3. Manufacturing, transport and commissioning process. 1.4. General description of systems. 1.5. Implementation phases. Didactic Unit 2. Tools and equipment in the assembly of precast concrete. 2.1. Safety equipment. Auxiliary means. 2.2. Lifting equipment. Types and accessories. Lifting techniques. 2.3. Hand tools. Description and use. 2.4. Tool selection and handling exercises. Didactic Unit 3. Assembly of prefabricated concrete pillars. 3.1. General concepts of pillar placement. 3.2. Types of assembly used. Characteristics and particularities of each type. 3.3. Assembly sequence 3.4. Exercises for the interpretation of assembly and redesign plans. Didactic Unit 4. Assembly of prefabricated concrete beams and alveolar slab slabs. 4.1. General concepts of beams and slabs. 4.2. Types of beams. Fixing modes. Types of supports. Auxiliary elements. 4.3. Mounting of alveolar slabs. 4.4. Auxiliary elements, accessories.

	4.5. Assembly sequence. Subsequent operations. 4.6. Exercises in the interpretation of assembly plans, reworking and selection of elements and tools. Didactic Unit 5. Assembly of prefabricated concrete roofing systems and elements. 5.1. General concepts of roof formation with precast concrete elements. 5.2. Prefabricated concrete roofing elements. Beams (delta, magazine, gutter), joists, tubular… 5.3. Modes of attachment of the different elements. Supports. Auxiliary elements. Details. 5.4. Assembly sequence. Auxiliary means. 5.5. Exercises in the interpretation of assembly plans, reworking and selection of elements and tools. Didactic Unit 6. Assembly of prefabricated panels for facades. 6.1. Types of panels. Characteristics and range of use. 6.2. Support structures according to formats. Fixing systems. 6.3. Lifting and positioning techniques. 6.4. Assembly sequence. Checks. Adjustment, support and leveling. 6.5. Final operations. Protection of anchors. Sealing panels. 6.6. Exercises in the interpretation of assembly plans, rethinking and selection of elements and tools. Sealing Practices. Didactic Unit 7. Basic concepts of organization and planning in the assembly of precast concrete elements 7.1. General organization of the pit. Adaptation to the security plan, delimitation... 7.2. Receipt of materials management of stockpiles, storage and waste. 7.3. Mounting equipment. Roles and functions. 7.4. Machinery, auxiliary equipment, equipment 7.5. Coordination with other trades and simultaneous work. 7.6. Production cycle: design, planning, manufacture, transport and commissioning. 7.7. Coordination of assembly with the complete production cycle. 7.8. Verification and quality control. 7.9. Interpretation of assembly plans. Use of computer means to consult and share information. 7.10. Exercises to interpret assembly plans with provision for equipment and equipment. Information management exercise on mobile devices. Didactic Unit 8. Mock-up assembly with the usual prefabricated concrete construction systems 8.1. Mounting pillars and beams. 8.2. Mounting covered structure. 8.3. Mounting panels. 8.4. Sealing panels and other final operations.

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