SDG -11

ADDRESS-electrical engineering

COMPETENCE	Skills	Knowledges
P* **Use programming languages, of different levels, referred to specific application areas**	Develop application programs for monitoring and control of simple systems	Advanced and low-level programming languages
	Use the dedicated software for the analysis of controls and the simulation of the controlled system	Use of dedicated software specific to the sector
	Develop application programs for monitoring and control of automated systems	Programming of microprocessor and microcontroller systems
	Implement programs of increasing complexity related to the management of automatic systems in a civil environment.	Programmable systems. Programming of Programmable Logic Controllers
	Programming of microprocessor and microcontroller systems	Arduino ONE Description and programming of the integrated devices within the microcontroller
	Implement programs of increasing complexity related to the acquisition and processing of data	Advanced and low-level programming languages Management of data acquisition cards Home automation and energy saving Industrial automation systems

ADDRESS-Electronic

COMPETENCE	Skills	Knowledges
P* Analyze the operation, design and implement automatic systems	Analyze and evaluate the problems and conditions of stability in the planning phase	Criteria for system stability Automatic data acquisition systems
	Analyze even complex robotic systems by identifying the parts that compose them and by designing some simple elements Develop robotic systems	Basic elements of robotics. Robotics and industrial robotics Components and systems for advanced industrial automation.
	Design complex and integrated control systems	"Intelligent" sensors and related management techniques Real-time control systems Signal transmission in control systems. Control architecture with supervision system

ADDRESS-Logistic

COMPETENCE	Skills	Knowledges
P* Identify, describe and compare the types and functions of the various transport vehicles and systems	Compare the means of transport in relation to employment.	Types and performances of means of transport, structures, production and construction processes, vehicle dynamics.
	Compare the possible systems, constructive elements and systems in relation to the use and the environment in which the vehicle is moving	Configurations of the vehicle from the fluid-dynamic point of view.
		Mechanical, technological and functional characterization of engineering materials, components and parts of the vehicle. Structural tests, tests and tests

COMPETENCE	Skills	Knowledges
P* Manage the operation of a specific means of transport and intervene in the planning, construction and design phases maintenance of its various components	Making simple design, construction and transformation choices for metallic materials and not to be used in the construction of the means of transport	Configuration of the vehicle according to the use and type of transport. Technical drawing standards. Software for schematization and design design.
	Identify and describe the different types of inspection and control used in vehicle maintenance.	Type of defects and inspection techniques
	Identify and apply the technical regulatory provisions specifications for the means of transport	Mechanical, technological and functional characterization of engineering materials, components and parts of the vehicle. Structural tests
	Identify and apply technologies adapted to the needs of construction and maintenance of components or simple systems	Working procedures, construction, assembly, disassembly and regulation of structural elements, systems, and connection organs, according to industry standards
	Apply the techniques of production, transformation, treatment of materials and coating of the surfaces of vehicles and transport systems	Methods for monitoring and evaluation of process and product
	Basic safety concepts, risk analysis, prevention and protection systems, procedures application	Identify and apply the EU reference international quality standards.

ADDRESS- Environment and territory construction

COMPETENCE	Skills	Knowledges
P* Apply the methodologies of the design, evaluation and construction of buildings and small-scale buildings, in non-seismic areas, also intervening in the problems related to energy saving in buildings	Analyze binding reactions and internal actions in flat structures using vector calculations	Relations between forces acting on structural elements, vector calculus
	Check the static equilibrium conditions of a building	Characteristics and classification of solicitations,
	Calculate the stresses by recognizing the internal tensions due to compression, tension, cut and flexion	Isostatic, hyper static and labile structures. Force method for the analysis of hyper static structures
	Analyze, calculate and verify simple isostatic and hyper static structures	Classification of the limit states and calculation with the semi-probabilistic method to the limit states.
	Understand the static functionality of structural elements in order to design and dimension them correctly	Calculation of simple construction elements Principles of geotechnics Types of support works
	Recognize the main building elements of a building.	Principles of anti-seismic regulations
	Apply the basic anti-seismic criteria and techniques in the design of competence Identify and apply the rules related to the individual installations of a building. Adopt constructive criteria for energy saving in buildings.	Structural setting of new buildings with anti-seismic characteristics. Types of installations for buildings; standards, materials and technologies. Energy conversion processes and energy saving technologies in buildings.

ADDRESS -environmental biotechnology

COMPETENCE	Skills	Knowledges
P* Intervening in the planning of activity and control of the quality of work in chemical and biotechnological processes	Apply safety and prevention regulations for the protection of health and the environment	Safety and prevention rules
	Apply the classical and instrumental analytical methods according to the identified operational sequence	Methods of qualitative, quantitative and instrumental chemical analysis. Electrochemical, optical and chromatographic analysis methods
	Establish waste disposal and recovery techniques.	Waste disposal procedures Technologies for the treatment of gaseous waste, water and soil, sludge disposal and biogas production, bioremediation and recovery of contaminated sites
	Analyze the process scheme of a biological wastewater treatment plant and the main chemical, physical and biological parameters.	
	Identify monitoring techniques for the protection and protection of the environment and safety in the workplace	Sampling techniques, study of environmental matrices. Industry specific regulation
	Contribute to reducing environmental impacts by favoring processes and products for sustainable chemistry	
	Analyze the techniques to promote energy savings	Recycling and energy recovery from waste. Heating systems and techniques to promote energy savings

P*- professionalizing competence specific for the study address and common to several subjects

SDG 11- LEARNING OUTCOMES:

- Provide access to safe, convenient and sustainable transport for all, improving road safety, expanding public transport and paying particular attention to those in sensitive situations.
- Reduce the negative environmental impact per capita, paying special attention to the air quality and waste management
- Support positive economic, social and environmental reports between urban, sub-urban and rural areas through the strengthening of urban planning at national and regional level.
- Sustainable resilient buildings and spatial planning (building materials, energy saving, planning processes)

SDG-13

ADDRESS –mechatronic/mechanics

COMPETENCE	Skills	Knowledges
P* Operate in compliance with the legislation on the safety and health of workers in the workplace and environmental protection	Identify the hazards associated with production activities	Risks associated with work activity
	Evaluate the environmental impact related to emissions, making appropriate choices for the protection of the environment	National and Community legislation concerning safety in the workplace
	Knowing how to apply the fire prevention rules in relation to the type of plant	Effects of various types of emissions connected with production activities Obligations of the employer and workers Safety of facilities for use and transformation of energy Fire prevention rules

COMPETENCE	Skills	Knowledges
P* Design, test and plan the maintenance of energy use plants	Analyze the energy problem by analyzing the use of various energy sources	Traditional and renewable energy sources
	Production, transfer and use of thermal energy, by dimensioning the system components	Characteristics of fluids and related laws of motion
	Mastering the production, transfer and use of thermal energy systems, by dimensioning the system components	Heat transfer mode
	Know how to test a heating system, evaluating its performance, efficiency and efficiency	Co-generation plants and use of alternative and renewable sources

ADDRESS-Energy

COMPETENCE	Skills	Knowledges
P* Design, test and plan the maintenance of energy use plants	Analyze the energy problem by analyzing the use of various energy sources	Traditional and renewable energy sources
	Production, transfer and use of thermal energy, by dimensioning the system components	Characteristics of fluids and related laws of motion
	Mastering the production, transfer and use of thermal energy systems, by dimensioning the system components	Heat transfer mode
	Know how to test a heating system, evaluating its performance, efficiency and efficiency	Co-generation plants and use of alternative and renewable sources

ADDRESS -environmental biotechnology

COMPETENCE	Skills	Knowledges
P* Intervening in the planning of activity and control of the quality of work in chemical and biotechnological processes	Apply safety and prevention regulations for the protection of health and the environment	Safety and prevention rules
	Apply the classical and instrumental analytical methods according to the identified operational sequence	Methods of qualitative, quantitative and instrumental chemical analysis. Electrochemical, optical and chromatographic analysis methods
	Establish waste disposal and recovery techniques.	Waste disposal procedures Technologies for the treatment of gaseous waste, water and soil, sludge disposal and biogas production, bioremediation and recovery of contaminated sites
	Analyze the process scheme of a biological wastewater treatment plant and the main chemical, physical and biological parameters.	
	Identify monitoring techniques for the protection and protection of the environment and safety in the workplace	Sampling techniques, study of environmental matrices. Industry specific regulation
	Contribute to reducing environmental impacts by favoring processes and products for sustainable chemistry	
	Analyze the techniques to promote energy savings	Recycling and energy recovery from waste. Heating systems and techniques to promote energy savings

COMPETENCE	Skills	Knowledges
P* Develop chemical and biotechnological projects and manage laboratory activities	Identify and select information on chemical systems, techniques and processes	Safety standards and procedures and accident prevention Analysis in the environmental sectors
	Apply environmental protection and safety regulations with awareness	
	Identify suitable tools and methods for organizing and managing laboratory activities	
	Identify the main interactions occurring between natural ecosystems and analyze biotic indicators	Environment and ecosystems Inheritance and mutations
	Recognize and explain the genetic engineering methods	
	Identify the types of biomass and the techniques to use these energy sources	Biomasses

COMPETECE	Skills	Knowledges
P* Check projects and activities, applying the regulations on environmental protection and safety	Consult national and community regulations	National and Community sector regulations Safety standards and procedures and accident prevention
	Apply safety and prevention regulations for the protection of health and the environment	
	Use the lexicon and technical terminology of the sector also in English	National and Community sector regulations
	Analyze the operating principles of the main energy production systems and their environmental impact	Solar and wind energy, hydroelectric and geothermal
	Establish the mechanisms of dispersion and bioaccumulation of pollutants	Anthropic activity and influence on the environmental sectors
	Identify pollutants emitted in the environmental compartments and methods of chemical, physical, biological and microbiological investigation required by law	Waste disposal procedures. Monitoring techniques

P*- professionalizing competence specific for the study address and common to several subjects

SDG 12- LEARNING OUTCOMES

- Eco-friendly management of chemicals and waste through their life cycle, according to international standards, and substantially reduce the release of these in the air, water and soil, so that their negative impact on human health and the environment be minimal.
- Encourage companies, especially multinationals or large ones, to adopt sustainable practices and to integrate these practices into their regular reports.
- Ensure that every human being acquires awareness of sustainable development and lifestyles in harmony with nature.

SDG 13- LEARNING OUTCOMES

- Strengthen resilience and adaptability to climate and natural disasters in all countries.
- Integrate measures to combat climate change in national policies, strategies and plans.
- Improving teaching and awareness raising, enhancing the capacities of citizens and institutions on climate change in terms of mitigation, adaptation, impact reduction and early warning.

SDG-13

ADDRESS- Agrarian/ territory management

COMPETENCE	Skills	Knowledges
P* Identify and describe the significant characteristics of environmental contexts; organize environmentally friendly production activities; interpret and apply Community, national and regional regulations concerning integrated agricultural activities; implement promotional activities for the enhancement of agri-food products linked to the territorial characteristics, as well as the quality of the environment	Detect environmental and territorial structures	Attitudes and classifications of the territories.
	Identify the different territorial attitudes through the use of suitable classification systems	Skills of local administrative bodies
	Identify measures to protect the environment and biodiversity	Interventions to protect the environment.
	Identify measures to protect the environment and biodiversity	
	Activate methods of collaboration with local authorities and offices.	Environmental and territorial legislation. Environmental impact assessment. Types of landscape and related characteristics
	Organize environmentally friendly production activities.	

ADDRESS- Agrarian/ crop systems

COMPETENCE	Skills	Knowledges
P* Identify and describe the significant characteristics of environmental contexts; organize environmentally friendly production activities; interpret and apply Community, national and regional regulations concerning integrated agricultural activities; implement promotional activities for the enhancement of agri-food products linked to the territorial characteristics, as well as the quality of the environment	Detecting environmental situations at the "macro" level. Identify and define ways to implement hydraulic and agrarian arrangements and irrigation systems.	Biological characteristics and agronomic needs in crops of agrarian interest. Crop techniques and defense interventions.
	Define cultivation plans respecting the environment. Identify species and cultivars in relation to environmental and market situations	Morphological, biological, productive features of shrub and tree crops. Selection criteria for species and cultivars. Plant, breeding, cultivation techniques.
	Organize land management interventions.	Defense interventions and related legislation. Sustainable and biological productions
	Identify systems compatible with mechanized exercises and quality productions	
	Check the suitability of propagation materials.	Quality and its evaluation
	Organize defense interventions respecting the environment and the quality of the product.	
	Identify the regulations on safety and environmental protection in relation to production activities in the sector	National and Community regulations: by sector, on safety and environmental protection

ADDRESS -environmental biotechnology

COMPETENCE	Skills	Knowledges
P* Develop chemical and biotechnological projects and manage laboratory activities	Identify and select information on chemical systems, techniques and processes	Safety standards and procedures and accident prevention Analysis in the environmental sectors
	Apply environmental protection and safety regulations with awareness	
	Identify suitable tools and methods for organizing and managing laboratory activities	
	Identify the main interactions occurring between natural ecosystems and analyze biotic indicators	Environment and ecosystems Inheritance and mutations
	Recognize and explain the genetic engineering methods	

COMPETENCE	Skills	Knowledges
P* Intervening in the planning of activity and control of the quality of work in chemical and biotechnological processes	Apply safety and prevention regulations for the protection of health and the environment	Safety and prevention rules
	Apply the classical and instrumental analytical methods according to the identified operational sequence	Methods of qualitative, quantitative and instrumental chemical analysis. Electrochemical, optical and chromatographic analysis methods
	Establish waste disposal and recovery techniques.	Waste disposal procedures Technologies for the treatment of gaseous waste, water and soil, sludge disposal and biogas production, bioremediation and recovery of contaminated sites
	Analyze the process scheme of a biological wastewater treatment plant and the main chemical, physical and biological parameters.	
	Identify monitoring techniques for the protection and protection of the environment and safety in the workplace	Sampling techniques, study of environmental matrices. Industry specific regulation
	Contribute to reducing environmental impacts by favoring processes and products for sustainable chemistry	
	Analyze the techniques to promote energy savings	Recycling and energy recovery from waste. Heating systems and techniques to promote energy savings

P*- professionalizing competence specific for the study address and common to several subjects

SDG 15- LEARNING OUTCOMES

- Ecology: competition, predator-prey, community dynamics, energy flow through food webs, dispersal and ranges.
- Specific ecosystems – local and global native ecosystems and also human-made ones, e.g. managed forestry plantations
- Threats to biodiversity: habitat loss, deforestation, fragmentation, invasive species and overexploitation (caused by unsustainable production and consumption practices, unsustainable technologies, etc.)
- The dangers of extinction: Individually endangered species, how extinction is forever, the long time needed to form species, and the six mass extinctions
- Restoration of wildlife and seeing humans as a healing force