

Graduate in Food Engineering

Program's Educational Objectives (PEOs)

GRADUATE IN FOOD ENGINEERING BY THE POLYTECHNIC UNIVERSITY OF MADRID (Educational Objectives of Title)	
Objective Number	Target Description
Obj. 1	Students must acquire the capacity for preparation, design, drafting and signing of projects whose purpose is to construction, alteration repair, maintenance, demolition, fabrication, installation, assembly or use of real property and chattels which by its nature and characteristics are included into the agricultural and livestock production (facilities or buildings, farms, infrastructure and rural roads), the food industry (extractive industries, fermentation, milk, canned food, fruit and vegetables, meat, fish, salted fish and overall production any other dedicated to the production and processing, storage, handling and distribution of food products), gardening and landscaping (urban green spaces and / or rural - parks, gardens, nurseries, urban trees, etc), public sports facilities or private and environments subject to landscape recovery in the field of food engineering.
Obj. 2	Students must build an adequate knowledge of the physical problems, technologies, machinery and systems for water and energy supply, the constraints imposed by cost factors and building regulations, and relationships between facilities or buildings of the food industries with their social and environmental surroundings as well as the need to relate those and the environment with human needs and preservation the environment, in the field of food engineering.
Obj. 3	Students acquire the ability to manage the execution of the works of projects related to agribusiness, and buildings, infrastructure and facilities, prevention of risks associated with the implementation and management of equipment multidisciplinary and management of human resources in accordance with criteria ethics in the field of food engineering.
Obj. 4	Students acquire the skills for drafting and executing measurements, segregations, subdivisions, valuations and appraisals within the rural areas, the agribusiness technique itself and spaces related to gardening and landscaping, with and without character of reports expert for judicial or administrative bodies, regardless of use of the real or personal property, in the field of food engineering.

Obj. 5	Students must acquire the capacity to conduct firm environmental impact assessments and plan waste management of agribusiness, agriculture and livestock, and related to gardening and landscaping areas, in the field of food engineering.
Obj. 6	Students must acquire leadership and management skills to work in all agribusiness, farms, urban and / or rural parks, and public or private sports areas with knowledge of new technologies, processes, quality, traceability and certification and marketing techniques and marketing of food products and plants grown in the field of food engineering.
Obj. 7	Students must acquire knowledge of basic science and technology to be able to continue learning and build the capacity adapt to new situations and changing environments.
Obj. 8	Students must acquire the ability to solve problems and cope with stressful conditions with creativity, initiative, adequate method and critical thinking.
Obj. 9	Students must acquire leadership skills, communication and transmission of knowledge and skills in the social environment within which the professional activity is conducted.
Obj. 10	Students must acquire the ability to review, interpret and use the laws, regulations and statutes that rule their professional practice.
Obj. 11	Students must acquire the ability to develop their activities, assuming a social, ethical and environmental commitment in tune with reality, and human and natural environments.
Obj. 12	Students must acquire the ability to work in multidisciplinary and multicultural teams.

Student Outcomes (Transversal Competences)

GRADUATE IN FOOD ENGINEERING BY THE POLYTECHNIC UNIVERSITY OF MADRID (Student Outcomes of Title)	
Outcome Number	Target Description
CT. 1	Oral and written communication. Ability to communicate ideas, problems and solutions, both to specialized and non-specialized audiences.
CT. 2	Analysis / synthesis and critical reasoning. Ability to critically evaluate arguments, hypotheses, abstract concepts and data, applying scientific and engineering knowledge, in order to make technical judgments and contribute to the solution of complex problems.
CT. 3	Problem solving. Ability to describe, organize and analyze the constituent elements of an engineering problem and design strategies that allow reaching a technically, environmentally and economically viable solution.
CT. 4	Ethical and professional commitment. Ability to recognize the ethical principles for decision-making in the professional field, within their field of study, knowing and applying the regulations of engineering practice, with quality criteria and being aware of the implications social, health and safety, environmental, economic and industrial.
CT. 5	Respect for the environment. Ability to offer solutions compatible with the conservation of the environment in a responsible and sustainable way, in order to avoid or reduce the negative effects produced by inappropriate practices caused by human activity and enhance the benefits that the activity may generate engineering professional, in the environmental field.
CT. 6	Organization and planning. Ability to establish the objectives of an engineering job or project and schedule the activities necessary for their achievement, determining their phases and execution time, as well as the resources necessary to achieve the objective set.
CT. 7	Use of the English language. Ability to communicate information, ideas, problems and solutions, effectively in English, both to the engineering community and to society in general.
CT. 8	Teamwork and skills in interpersonal relationships. Ability to work in an international context, joining multidisciplinary and multicultural teams.
CT. 9	Use of Information and Communication Technologies and information management. Ability to handle information and communication technologies, enabling the search and consultation of specialized bibliography, using scientific databases and other appropriate sources of information , in order to carry out technical or research work typical of their field of study.

CT. 10	Leadership and decision-making. Ability to lead teams, contributing to their personal and professional development, in order to achieve a goal set in their field of study (processes, products, systems, etc.) taking into account social and environmental limitations. , economic and industrial, knowing how to choose the best alternative to act and being responsible for the scope and consequences of the option taken.
CT. 11	Lifelong learning. Having acquired knowledge in basic, scientific and technological subjects and being up to date with the main current issues, which allow the development of efficient autonomous learning, with the ability to adapt to scientific, technological and new changes techniques as part of a process of continuous self-learning, in the field of engineering.
CT. 12	Creativity. Ability to design a system, component, process or experiment and to solve in an original way situations or problems in the field of engineering.

Specific Outcomes

GRADUATE IN FOOD ENGINEERING BY THE POLYTECHNIC UNIVERSITY OF MADRID (Specific Outcomes of Title)	
Outcome Number	Target Description
CE. 1	The capacity to solve mathematic problems that can arise in engineering. Aptitude to apply knowledge of: linear algebra; geometry; differential geometry; differential and integral calculus; differential and partially derived equations; numerical methods, numerical algorithms; statistics and optimisation.
CE. 2	The ability of spatial vision and knowledge of graphical representation techniques, both by traditional methods of metric geometry and descriptive geometry, through computer-aided design applications.
CE. 3	Basic knowledge about the use and programming of computers, operating systems, databases and computer programs with an engineering application.
CE. 4	Basic knowledge of general chemistry, organic and inorganic chemistry and their applications in engineering.
CE. 5	Comprehension and command of the basic concepts of the general laws of mechanics, thermodynamics, fields, and waves and electromagnetism and its application for problem solving in engineering.
CE. 6	Basic knowledge of geology and morphology of the ground and its application in problems related with engineering. Climatology.
CE. 7	Adequate knowledge of the concept of business, institutional and legal framework of the business. Organisation and management of businesses.
CE. 8	Knowledge of the biological bases and fundamentals of the plant and animal field in engineering.
CE. 9	The capacity to know, understand and use the principles of: Identification and characterisation of plant species.
CE. 10	The capacity to know, understand and use the principles of the bases of plant production, production systems, of protection and exploitation.
CE. 11	The capacity to know, understand and use the principles of the bases of animal production. Livestock facilities.

CE. 12	The ability to know, understand and use the principles of applications of biotechnology in agricultural and livestock engineering.
CE. 13	The capacity to know, understand and use the principles of ecology. Study of environmental impact: evaluation and restoration.
CE. 14	The capacity to know, understand and use the principles of topographic surveying and replanting. Cartography, photometric, geographical information systems and remote sensing in agronomy.
CE. 15	The capacity to know, understand and use the principles of rural engineering: calculation of structures and construction, hydraulics, engines and machines, electrical engineering, technical projects.
CE. 16	The capacity to know, understand and use the principles of management and use of agro-industrial by-products.
CE. 17	The capacity to know, understand and use the principles of decision making through the use of available materials for work in multidisciplinary groups.
CE. 18	The capacity to know, understand and use the principles of technology transference, understanding, interpreting, communicating and adopting the advances in the agrarian field.
CE. 19	The capacity to know, understand and use the principles of agrarian and commercial business evaluation.
CE. 20	The capacity to know, understand and use the principles of food engineering and technology, basic good engineering and operations, food technology, process in food industries, modelling and optimisation, quality management and food safety, food analysis and traceability.
CE. 21	The capacity to know, understand and use the principles of food industry engineering, food industry auxiliary equipment and machinery, automation and control of processes, engineering of works and facilities, agro-industrial constructions, management and use of waste.
CE. 22	Original exercise to individually carry out, present and defend in front of a university tribunal, consistent in the project in the area of specific technologies of agricultural engineering in a professional nature, in which synthesise and integrate the skills acquired in the teachings.

Since 2019/20 cycle

**GRADUATE IN FOOD ENGINEERING
BY THE POLYTECHNIC UNIVERSITY OF MADRID
(Student Outcomes ABET of Title)**

Outcome Number	Target Description
SO 1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
SO 2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
SO 3	An ability to communicate effectively with a range of audiences.
SO 4	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
SO 5	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
SO 6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
SO 7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.