

## I. GENERAL PROVISIONS

### MINISTRY OF SCIENCE AND INNOVATION

**2803** Order CIN/323/2009, of February 9, which establishes the requirements for the verification of official university degrees that qualify for the exercise of the profession of Agricultural Technical Engineer.

The ninth additional provision of Royal Decree 1393/2007, of October 29, which establishes the organization of official university education, establishes that the Ministry of Science and Innovation will specify the contents of its Annex I to which they must comply the applications submitted by universities to obtain verification of the study plans leading to the obtaining of official Bachelor's or Master's degrees, provided for in article 24, which enable the exercise of regulated professions.

Current legislation establishes the profession of Agricultural Technical Engineer as a regulated profession whose exercise requires being in possession of the corresponding official Degree title obtained, in this case, in accordance with the provisions of article 12.9 of the aforementioned Royal Decree 1393/2007, in accordance with the conditions established in the Agreement of the Council of Ministers of December 26, 2008, published in the "Official State Gazette" of January 29, 2009.

In said Agreement, while the appropriate reforms to the regulation of professions in general in Spain are established, the conditions to which the study plans must be adapted are determined. In its fourth section, in relation to the ninth additional provision mentioned above, it entrusts the Minister of Science and Innovation with establishing the requirements regarding objectives and title of the title and planning of the teachings.

Therefore, in view of the aforementioned provisions, it is appropriate to establish the requirements to which the study plans leading to obtaining the Degree titles that qualify for the exercise of the profession of Agricultural Technical Engineer must be adapted, which present the universities for verification by the Council of Universities.

In the preparation of this order, the interested colleges and professional associations have been heard. It has also been informed by the Government Delegate Commission for Economic Affairs at its meeting on January 29, 2009.

In its virtue, following a report from the Council of Universities, I have:

Unique item. *Requirements of the study plans leading to obtaining the Degree titles that qualify for the exercise of the profession of Agricultural Technical Engineer.*

The study plans leading to obtaining the Degree titles that enable the exercise of the profession of Agricultural Technical Engineer, must comply, in addition to the provisions of Royal Decree 1393/2007, of October 29, by which establishes the organization of official university education, the requirements regarding the sections of Annex I of the aforementioned Royal Decree that are indicated in the Annex to this Order.

First final provision. *Application and development enablement.*

The General Directorate of Universities is authorized to issue the necessary resolutions for the development and application of this Order.

Second final provision. *Entry into force.*

This Order will come into force on the day following its publication in the "Official State Gazette."

Madrid, February 9, 2009. -The Minister of Science and Innovation, Cristina Garmendia Mendizábal.

## EXHIBIT

### **Establishment of requirements regarding certain sections of Annex I of the Royal Decree 1393/2007, of October 29, which establishes the organization of official university education, relating to the report for the request for verification of official degrees**

Section 1.1 *Name.* -The name of the degrees must comply with the provisions of the second section of the Agreement of the Council of Ministers of December 26, 2008, which establishes the conditions to which the study plans leading to the obtaining titles that enable the exercise of the regulated profession of Agricultural Technical Engineer, published in the "Official State Gazette" of January 29, 2009 by Resolution of the Secretary of State for Universities of January 15, 2009, already provided in this Order. So:

1. The name of the official university degrees referred to in the previous section must facilitate the identification of the profession for which it is qualified and, in no case, may it lead to error or confusion regarding its professional effects.

2. No study plan corresponding to an official university degree whose name includes the express reference to the profession of Agricultural Technical Engineer may be subject to verification by the Council of Universities, without said degree meeting the conditions established in the aforementioned Agreement. and in this Order.

Section 3. Objectives. -Competencies that students must acquire:

Ability to pre-prepare, conceive, draft and sign projects that have as their objective the construction, renovation, repair, conservation, demolition, manufacturing, installation, assembly or exploitation of movable or immovable property that, due to their nature and characteristics, are included in the technique of agricultural and livestock production (facilities or buildings, farms, infrastructure and rural roads), the agri-food industry (extractive, fermentative, dairy, canning, fruit and vegetable, meat, fishing, salting industries and, in general, any other dedicated to the preparation and/or transformation, conservation, handling and distribution of food products) and gardening and landscaping (urban and/or rural green spaces - parks, gardens, nurseries, urban trees, etc. -, public or private sports facilities and environments undergoing landscape recovery).

Adequate knowledge of the physical problems, technologies, machinery and water and energy supply systems, the limits imposed by budgetary factors and construction regulations, and the relationships between facilities or buildings and agricultural operations, agri-food industries and spaces related to gardening and landscaping with their social and environmental surroundings, as well as the need to relate those and that environment with human needs and environmental preservation.

Ability to direct the execution of the works that are the object of the projects related to agri-food industries, agricultural operations and green spaces and their buildings, infrastructure and facilities, the prevention of risks associated with this execution and the direction of multidisciplinary teams and human resources management, in accordance with deontological criteria.

Ability to draft and sign measurements, segregations, subdivisions, valuations and appraisals within the rural environment, the industry's own technique

agri-food industry and spaces related to gardening and landscaping, whether or not they are in the nature of expert reports for judicial or administrative bodies, and regardless of the use to which the movable or immovable property subject to them is intended.

Ability to draft and sign studies on rural development, environmental impact and waste management of agri-food industries, agricultural and livestock farms, and spaces related to gardening and landscaping.

Ability to direct and manage all types of agri-food industries, agricultural and livestock farms, urban and/or rural green spaces, and public or private sports areas, with knowledge of new technologies, quality processes, traceability and certification and marketing and commercialization techniques for food products and cultivated plants.

Knowledge in basic, scientific and technological subjects that allow continuous learning, as well as the ability to adapt to new situations or changing environments.

Ability to solve problems with creativity, initiative, methodology and critical thinking.

Leadership, communication and transmission of knowledge, skills and abilities skills in social areas of action.

Ability to search and use the rules and regulations relating to its scope of action.

Ability to develop its activities, assuming a social, ethical and environmental commitment in tune with the reality of the human and natural environment.

Ability to work in multidisciplinary and multicultural teams.

*Section 5. Teaching planning.*

The titles referred to in this agreement are official university degree courses, and their study plans will have a duration of 240 European credits referred to in article 5 of the aforementioned Royal Decree 1393/2007, of October 29.

They must take the basic training block of 60 credits, the common block for the agricultural branch of 60 credits, a complete block of 48 credits, corresponding to each area of specific technology, and complete a final degree project of 12 credits.

The study plan must include at least the following modules:

Module	No. of credits Europeans	Skills to be acquired
Basic training.	60	<p>Ability to solve mathematical problems that may arise in engineering. Ability to apply knowledge of: linear algebra; geometry; differential geometry; differential and integral calculus; differential and partial differential equations; numerical methods, numerical algorithms; statistics and optimization.</p> <p>Capacity for spatial vision and knowledge of graphic representation techniques, both through traditional methods of metric geometry and descriptive geometry, and through computer-aided design applications.</p> <p>Basic knowledge of the use and programming of computers, operating systems, databases and computer programs with applications in engineering.</p> <p>Basic knowledge of general chemistry, organic and inorganic chemistry and their applications in engineering.</p> <p>Understanding and mastery of the basic concepts of the general laws of mechanics, thermodynamics, fields, waves and electromagnetism and their application to solve engineering problems.</p>

Module	No. of credits Europeans	Skills to be acquired
		<p>Basic knowledge of geology and terrain morphology and its application in engineering-related problems. Climatology. Adequate knowledge of the concept of a company, institutional and legal framework of the company. Business organization and management.</p> <p>Knowledge of the bases and biological foundations of the field plant and animal in engineering.</p>
Common to the Agricultural branch.	60	<p>Ability to know, understand and use the principles of:</p> <p>Identification and characterization of plant species. The bases of plant production, production, protection and exploitation systems.</p> <p>The basis of animal production. Livestock facilities. Applications of biotechnology in agricultural engineering and livestock Ecology. Environmental impact study: evaluation and correction. Surveys and topographical layouts. Cartography, Photogrammetry, geographic information systems and remote sensing in agronomy.</p> <p>Rural engineering: calculation of structures and construction, hydraulics, engines and machines, electrical engineering, technical projects.</p> <p>The management and use of agroindustrial byproducts. Decision making through the use of available resources for work in multidisciplinary groups. Technology transfer, understand, interpret, communicate and adopt advances in the agricultural field. Valuation of agricultural companies and marketing</p>
Specific technology.  Agricultural and Food Industries.          Agricultural holdings.	48	<p>Ability to know, understand and use the principles of:</p> <p>Food engineering and technology.</p> <p>Basic food engineering and operations. Food Technology. Processes in the agri-food industries. Modeling and optimization. Quality and food safety management. Food analysis. Traceability. Engineering of agri-food industries.</p> <p>Equipment and machinery auxiliary to the food industry. Automation and process control. Engineering of works and installations. Agroindustrial constructions. Management and use of waste.</p> <p>Ability to know, understand and use the principles of:</p> <p>Animal production technologies. Animal anatomy. Animal physiology. Animal production, protection and exploitation systems. Animal production techniques. Genetics and animal improvement. Plant production technologies. Production and exploitation systems. Protection of crops against pests and diseases. Technology and cultivation systems of herbaceous species. Agroenergy.</p> <p>Agricultural Operations Engineering. Electrification of agricultural holdings. Farm Equipment. Systems and technology irrigation. Agricultural constructions. Facilities for animal health and welfare.</p>

Module	No. of credits Europeans	Skills to be acquired
Horticulture and Gardening.		<p>Ability to know, understand and use the principles of:</p> <p>Horticultural Production Technology. Bases and technology of horticultural, fruit and ornamental propagation and production. Quality control of fruit and vegetable products. Commercialization.</p> <p>Genetics and plant improvement. Engineering of green areas, sports spaces and fruit and vegetable farms.</p> <p>Civil works, facilities and infrastructure of green zones and protected areas. Electrification. Irrigation and drainage. Machinery for horticulture and gardening.</p> <p>Environmental and landscape engineering. Environmental legislation and management; Principles of sustainable development; Market and professional practice strategies; Valuation of environmental assets.</p> <p>Hydrology. Erosion. Plant material: production, use and maintenance; Ecosystems and biodiversity; Physical mean and climate change. Analysis, management and Territorial Planning Plans. Landscaping principles. Specific design and graphic expression tools; Practical development of environmental impact studies; Environmental and landscape restoration projects; Projects and maintenance plans for green areas; Development projects. Instruments for territorial and landscape planning; Management and planning of projects and works.</p>
Mechanization and buildings Rural.		<p>Ability to know, understand and use the principles of:</p> <p>Technologies of plant and animal production. Phytotechnics; Biotechnology and plant improvement; Crops; Crop protection; Gardening and Landscaping. Sport zones. Nutrition. Hygiene and animal production systems. Biotechnology and Animal improvement. Animal products. Bases and technology of rural constructions. Soil mechanics. Materials. Material resistance. Structure Design and calculation. Agricultural constructions. Infrastructure and rural roads.</p> <p>Agricultural mechanization. Engines and agricultural machines. Characteristics and design of machinery to agrary instalations. Agricultural automatic. Facilities engineering. Rural electrification. Irrigation and drainage technology. Hydraulic works and installations. Facilities for animal health and welfare.</p>
Final degree project	12	<p>Original exercise to be carried out individually and presented and defended before a university tribunal, consisting of a project in the field of specific technologies of Agricultural Engineering of a professional nature in which the skills acquired in the teachings are synthesized and integrated.</p>