26-27

Degree Guide

GRADO EN INGENIERÍA EN INTELIGENCIA ARTIFICIAL

CODE 7103

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PRESENTATION

Artificial Intelligence is currently one of the technological disciplines with the greatest impact and growth across all sectors of activity. Its influence extends to fields as diverse as medicine, finance, robotics, industry, commerce, and education, and its role as a driving force behind digital transformation has been recognized by governments, international organizations, and the scientific community as one of the defining phenomena of our time. This reality has generated a growing and sustained demand for highly trained professionals capable of designing, developing, and applying AI-based solutions in complex and multidisciplinary environments. In this context, the Higher Technical School of Computer Engineering at the UNED offers the Bachelor's Degree in Artificial Intelligence Engineering, an official degree program designed in accordance with the framework of the European Higher Education Area.

The degree guarantees a solid scientific and technological education that prepares graduates both for professional practice in the field of AI and for innovation and research. The curriculum provides comprehensive training that combines a strong foundation in mathematics, statistics, and programming with an in-depth study of the main paradigms of AI: machine learning, natural language processing, computer vision, autonomous robotics, decision support systems, and large-scale data analysis, among others. The program is structured with both a theoretical and generalist approach —offering rigorous foundational training in the fundamentals and different areas and techniques of AI —and a practical, application-oriented perspective focused on developing solutions to real-world problems across different domains.

The multidisciplinary nature of the degree is one of its essential features. The curriculum prepares students to collaborate with experts from a wide variety of fields —engineering, medicine, law, economics, and science —and to integrate into heterogeneous work teams where AI acts as a transversal tool. The program also includes training in project management and in the ethical and responsible aspects of intelligent systems development, in line with the Sustainable Development Goals promoted by the United Nations.

Graduates in Artificial Intelligence Engineering are qualified to perform professional roles in a wide range of sectors: financial institutions, healthcare organizations, technology consulting firms, R&D departments, public research institutions, universities, and industries of all kinds.

The degree is delivered through UNED's distance-learning model, allowing access to students throughout Spain and internationally, regardless of their place of residence or their professional and personal circumstances. Furthermore, it provides the necessary foundation for continuing education at the postgraduate level, with a natural pathway to university master's degrees such as Data Science and Engineering, Research in Artificial Intelligence, Language Technologies, or Cybersecurity, all of which are offered by the ETSIInf itself.

SKILLS

Learning Outcomes

PFG-CG25 –Ability to carry out an original project in the field of specific Artificial Intelligence technologies, of a professional nature, integrating and synthesizing the competencies acquired throughout the degree program, to be presented and defended before a university committee and individually assessed.

TYPE: Skills and abilities

RA-CD01 –Upon completion of the learning process, students will be able to determine the most appropriate ways to represent knowledge using logic-based formalisms, applying the foundations of data management and processing, including storage and processing, metadata management, efficient management of continuous data streams, and governance of complex data systems.

RA-CD02 –Upon completion of the learning process, students will be able to develop, including deployment into production environments, applications capable of extracting information from structured, semi-structured, or unstructured data —including text, images, video, and audio —through techniques for identifying and acquiring relevant data, reduction, compression, integration, transformation, cleaning, and quality assessment, including human-computer interfaces that effectively visualize such data in a user-centered manner.

RA-CD03 –Upon completion of the learning process, students will be able to evaluate the most appropriate machine learning methods for extracting valuable information for organizations, taking into account potential issues related to data quality, algorithmic bias, or data bias.

RA-CD04 –Upon completion of the learning process, students will be able to design solutions that derive new knowledge through inference or by means of data mining or machine learning methods, using robust learning and validation methodologies for problems involving the processing of large volumes of data.

RA-IA01 –Upon completion of the learning process, students will be able to determine the most suitable techniques for solving problems involving reasoning models in centralized and distributed environments, machine learning and advanced statistical techniques, perception and cognitive robotics techniques, intelligent entities and systems for knowledge acquisition and representation, data-to-knowledge transformation, and environment manipulation, in problems requiring the use of Artificial Intelligence infrastructures, environments, and techniques.

RA-IA02 –Upon completion of the learning process, students will be able to develop knowledge-based systems aimed at problem solving and decision-making requiring intelligent behavior, including supervised and unsupervised classification problems, discovery of conditional independence relationships between related variables, or systems capable of perceiving their environment for manipulation, navigation, and behavioral planning with a certain degree of autonomy.

RA-IA03 –Upon completion of the learning process, students will be able to evaluate the interaction needs of human-machine interfaces to ensure the accessibility of computer systems, services, and applications.

RA-IA04 –Upon completion of the learning process, students will be able to design intelligent entities and systems incorporating capabilities such as autonomy, environmental awareness, reactivity and proactivity, learning, social and organizational skills, as well as the architectures and infrastructures required to run AI-based systems.
RA-IA05 –Upon completion of the learning process, students will be able to integrate intelligent data analysis systems with production applications and services within Artificial Intelligence environments.
RA-IA06 –Upon completion of the learning process, students will be able to adapt Artificial Intelligence-based solutions to specific application environments, considering their efficient integration with existing infrastructures.
RA-IA07 –Develop extensions and specific add-ons for Artificial Intelligence systems through the incorporation of elements that enable the adaptation of these generic systems to the particular requirements of different applications and their deployment into production environments.
RA01 –Upon completion of the learning process, students will be able to apply the necessary knowledge of algebra, calculus, analysis, discrete mathematics, logic, and statistics to solve problems specific to Artificial Intelligence.
RA02 –Upon completion of the learning process, students will be able to demonstrate knowledge of AI regulations and legislation at national, European, and international levels, as well as the institutional and legal framework of organizations and companies for solving AI-related business problems in accordance with current principles, standards, and regulations.
RA03 –Upon completion of the learning process, students will be able to analyze intelligent services, applications, and systems, assessing their economic, social, and environmental impact in order to lead their implementation and continuous improvement, ensuring reliability, security, and quality in any Artificial Intelligence domain, in an inclusive manner and in accordance with ethical principles and applicable legislation and regulations.
RA04 –Upon completion of the learning process, students will be able to develop Artificial Intelligence projects by participating in their design, leadership, planning, deployment, and management, as well as in defining technical conditions in accordance with quality, reliability, legislation, regulatory requirements, ethical principles, and professional standards in Artificial Intelligence.
RA05 –Upon completion of the learning process, students will be able to apply effective negotiation and teamwork techniques, as well as communication and team leadership skills, in any Artificial Intelligence domain, in an inclusive manner and in accordance with ethical principles and current legislation.
RA06 –Upon completion of the learning process, students will be able to analyze requirements related to algorithms, computational complexity, programming, operating systems, databases, computer system structure, and system interconnection necessary for solving science and engineering problems, in accordance with the required principles of quality, reliability, and security.
RA07 –Upon completion of the learning process, students will be able to design human-computer interfaces in accordance with principles of quality, reliability, applicable legislation and regulations, and universal and inclusive design principles.

RA08 –Upon completion of the learning process, students will be able to demonstrate knowledge of the basic algorithmic procedures and data types of information technologies required to solve Artificial Intelligence problems.
RA09 –Upon completion of the learning process, students will be able to identify the algorithms, data structures, programming paradigms, and programming languages most appropriate for ensuring the reliability, security, and quality of applications addressing problems that require an Artificial Intelligence solution.
RA10 –Upon completion of the learning process, students will be able to demonstrate basic knowledge of computer structure and architecture, operating systems, distributed systems, computer networks, the Internet, and data storage, processing, and access systems necessary for the analysis and implementation of Artificial Intelligence applications based on these technologies.
RA11 –Upon completion of the learning process, students will be able to apply the acquired knowledge to the design, implementation, administration, and maintenance of computer systems, services, and applications related to Artificial Intelligence.
RA12 –Upon completion of the learning process, students will be able to demonstrate basic knowledge of parallel, concurrent, distributed, and real-time programming techniques required for the implementation of applications that demand such approaches.
RA13 –Upon completion of the learning process, students will be able to demonstrate knowledge and basic techniques of the different approaches to Artificial Intelligence and to integrate as Artificial Intelligence professionals within multidisciplinary teams.
RA14 –Upon completion of the learning process, students will be able to integrate advanced techniques and methodologies from their area of specialization into problems requiring Artificial Intelligence solutions within multidisciplinary human teams.

CREDIT AWARDS

The School of Computer Engineering offers the possibility of recognizing credits from previous university studies or vocational training studies through the credit recognition process.
On the website of the Higher Technical School of Computer Engineering (ETSIInf.), students can find the procedure, application form, and deadlines for submitting requests. In addition, there are already approved credit recognition tables for the different Bachelor's Degrees from various prior qualifications, which can be consulted there.

STRUCTURE

The curriculum is structured over four academic years of 60 ECTS credits (European Credit Transfer System) each, with the following distribution according to course type:

Course Type	ECTS
Basic Training	60

Compulsory subjects	156
Elective subjects	12
Bachelor's Thesis	12
Total	**240**

PROFILE

To pursue studies in this Degree program, it is strongly recommended that students have completed a secondary education track with a scientific or scientific-technological orientation, since the subjects in this degree build upon the knowledge acquired in those programs. These undergraduate studies require the ability for numerical and logical reasoning, as well as some capacity to understand and reason about abstract models that generalize the particular aspects of practical cases.

Students entering the University through the UNED entrance examinations for students over 25 years of age who intend to pursue this degree should have completed the specific phase of the examinations under Option B (Sciences), choosing "Physics" as one of the elective subjects, or under Option E (Engineering and Architecture).

A suitable admission profile is also considered to be that of students coming from higher-level vocational training programs directly related to Computer Science, including the following:

•Computer Systems Administration

•Network Computer Systems Administration

•Software Application Development

•Web Application Development

•Telecommunications and Computer Systems

For these latter two types of admission routes, students will probably need to make an additional effort in the scientific foundation subjects, since the recommended prior knowledge corresponds to that acquired in scientific or scientific-technological secondary education tracks. Therefore, it is recommended that these students take the introductory Physics and Mathematics preparatory courses ("Cursos 0") offered openly by UNED.

A basic/intermediate level of English is highly recommended, since students may encounter some subjects that use textbooks written in English. In addition, reading comprehension in English will facilitate the use of the extensive bibliography available in this language. To support students in this regard, UNED offers virtual language courses and language laboratories (at associated centers providing this type of instruction).

Furthermore, the particular characteristics of UNED as a distance-learning university require students to make an additional effort and to develop specific skills related to individual and group work, independent information searching, self-organization, and the planning of study and academic activities.

Finally, students interested in this degree should have a willingness to work in the field of Computer Science and, more generally, in the area of new technologies, as well as curiosity and initiative regarding the development of software applications and their impact on society.

CAREER OPPORTUNITIES

The increasing adoption of Artificial Intelligence across all sectors of economic and scientific activity has generated a sustained demand for professionals with specialized training in this discipline. Graduates in Artificial Intelligence Engineering possess a versatile and highly qualified technical profile that enables them to enter the labor market in a wide variety of roles and organizational contexts.

The core of the program —mathematics, statistics, programming, and mastery of the main AI paradigms —equips graduates to design and implement intelligent systems applicable to real-world problems. This foundation, combined with an engineering-oriented and multidisciplinary perspective, enables graduates to work effectively both in purely technological environments and in organizations where AI is applied as a supporting tool for core activities.

Main Professional Profiles

The most in-demand profile in today's job market is that of the **data scientist**, responsible for extracting valuable knowledge from large volumes of information through machine learning techniques, advanced statistics, and data visualization. Closely related to this role, the **machine learning engineer** focuses on the design, training, validation, and deployment of machine learning and deep learning models into production environments, including large language models and other generative AI systems that have gained central relevance in recent years.

Indeed, the emergence of generative AI has opened a broad new professional field. The **generative AI and language model engineer** works on the development, fine-tuning, and deployment of systems capable of autonomously generating text, images, code, audio, or video, as well as integrating them into products and services. This profile ranges from adapting foundation models using techniques such as fine-tuning or reinforcement learning from human feedback, to designing retrieval-augmented generation architectures. Applications span virtually every sector: intelligent assistants, automated content generation, information synthesis, programming assistance, and automation of document-based processes, among many others.

Another professional pathway with strong growth potential is that of the **natural language processing specialist**, dedicated to developing systems capable of understanding, generating, and translating human language text, with applications in virtual assistants, document analysis, information retrieval systems, and automated content detection. Similarly, the **computer vision specialist** develops systems for image and video analysis and interpretation, with applications in medicine, industry, security, and autonomous vehicles.

In the field of robotics, graduates may work as **cognitive and autonomous robotics engineers**, designing systems capable of perceiving their environment, reasoning, and acting autonomously in industrial, healthcare, or service applications. Likewise, the **decision**

support systems developer profile has a strong presence in sectors such as banking, insurance, healthcare, and logistics, where AI is used to optimize complex processes and support strategic decision-making.

Finally, the **AI and Industry 4.0 consultant** is a rapidly growing profile focused on identifying opportunities for AI application within business processes and leading their implementation.

Sectors of Activity

Employment opportunities are distributed across a wide variety of sectors. In healthcare, AI applications include medical imaging diagnosis, clinical record analysis, disease prediction models, and clinical decision support systems. In the financial and insurance sectors, AI is used for fraud detection, risk analysis, service personalization, and algorithmic trading. The manufacturing industry demands specialists in predictive maintenance, automated quality control, and production chain optimization. Public sector organizations and research institutions offer opportunities in smart city projects, e-government, security and defense, as well as astronomy, environmental science, and other scientific disciplines where large-scale data analysis is essential.

Research-Oriented Pathways

For those pursuing an academic or scientific career, the degree provides the necessary foundation to access specialized master's and doctoral programs, contributing to the advancement of knowledge in areas such as deep learning, cognitive and autonomous robotics, generative AI, explainable AI, and agentic AI.

Overall, the Bachelor's Degree in Artificial Intelligence Engineering addresses one of the professional profiles with the greatest growth potential in today's labor market, offering its graduates a privileged position from which to contribute to the digital transformation of society through a solid, ethical, and problem-solving-oriented education.

OFFICIAL DOCUMENTATION

In accordance with current legislation, all universities are required to submit their official degree programs to processes of verification, monitoring, and accreditation.

In the case of UNED, the Council of Universities receives the degree proposal and forwards it to ANECA for evaluation and the issuance of the verification report. If the report is favorable, the Council of Universities issues the verification resolution, and the Ministry of Education submits to the Government the proposal granting the degree official status, orders its inclusion in the Register of Universities, Centres and Degrees (RUCT), and its subsequent publication in the Spanish Official State Gazette (*Boletín Oficial del Estado*).

Official Bachelor's degree programs must renew their accreditation within six years from the date on which the program began to be taught or from the date of the previous accreditation renewal. The purpose of this process is to verify whether the results achieved are adequate to ensure the continuation of the program. If the outcomes are satisfactory, the Council of Universities issues the accreditation resolution for the degree program.

These resolutions and reports are recorded in the Register of Universities, Centres and Degrees (RUCT).

•Inscripción del título en el RUCT
•Informe de verificación de la ANECA
•Resolución de verificación del Consejo de Universidades
•Memoria de verificación

INTERNAL SYSTEM QUALITY ASSURANCE TITLE

UNED has an Internal Quality Assurance System (SGIC-U) that covers all its official Bachelor's, Master's, and Doctoral degree programs, as well as the services it provides. The design of this system was certified by ANECA.
The SGIC-U includes all the processes necessary to ensure the quality of its teaching staff, resources, and student services, including access, admission and orientation processes, external internships, mobility programs, academic guidance and employability support, monitoring and evaluation of learning outcomes, handling of suggestions and complaints, and the adequacy of support staff, among others.
The bodies responsible for the SGIC are:
•The Degree Coordination Committee
•The School Quality Assurance Committee
•The Dean's or Management Team
•The UNED Quality Assurance Committee
Through its Statistical Portal, UNED provides the entire university community with information regarding both academic performance results and satisfaction outcomes of the different stakeholder groups involved.

SGIC Documentation for the Degree Program

•Main academic performance indicators
•Satisfaction results of the different stakeholder groups
•Quality Assurance at the School

Degree Coordination Committee

•**Chair:** The Director of the Higher Technical School of Computer Engineering.
•**Coordinator of the Degree Committee.**
•**One Permanent Professor holding a PhD representing each Department affiliated with the School**, specifically:
•Department of Computer Languages and Systems
•Department of Artificial Intelligence
•Department of Computer Science and Automatic Control
•Department of Software Engineering and Computer Systems
•Department of Communication and Control Systems
•**Two Permanent Professors holding PhDs representing departments external to the School** that teach compulsory subjects within the degree program.

- **One member of the Administrative and Service Staff** linked to the academic management of the degree.
- **One representative of students enrolled in the degree program.**
- **One representative of tutors teaching within the degree program.**

RULES

- **RD 822/2021, of 28 September, on the Organization of University Education**
- **Regulations on Academic Progress and Continuation in Official Bachelor's and Master's Degree Programs**
- **Regulations on the Completion of Bachelor's Thesis Projects**
- **Regulations on Credit Recognition** (Governing Council of 23 October 2008, amended by Governing Councils of 28 June 2011 and 4 October 2016, and updated by Governing Councils of 10 October 2017 and 5 March 2019)
- **General Criteria for Academic Credit Recognition for Student Participation in Cultural, Sports, Student Representation, Solidarity, and Cooperation Activities** (approved by the Governing Council on 28 April 2010 and amended by the Governing Council on 4 October 2016)
- **Regulations Governing the Academic Compensation Committee**
- **Regulations for the Review of Final Examinations**
- **Procedure for Calculating the Grade Point Average in the Academic Record** (GC 26/06/2012, amended by GC 25/06/2013 and GC 5/05/2015)
- **Regulations on Enrollment in Semester-Based Bachelor's Thesis Courses** (Governing Council of 30 April 2019)

PRACTICES

- Internships

Internships are not included in this degree program.

- Experimental Practical Activities

As this is an experimental degree program, experimental practical activities are understood as those experimental-type activities whose successful completion is mandatory in order to pass the corresponding course. In the course guides —both the public and private sections, published respectively on the website and in the virtual courses —students will find detailed information on the development procedures required for each course.

ESTUDIANTE A TIEMPO PARCIAL

UNED provides education services to all types of students, including part-time students, that is, students who combine their studies with professional or family responsibilities. These students are advised to carefully assess the amount of time they will be able to devote to their studies and, if it is insufficient, not to enroll in a full academic year but only in a limited number of courses. This will help avoid withdrawals and unnecessary tuition expenses resulting from unrealistic planning.

CURSOS 0 DE NIVELACIÓN

Preparatory “Level 0” courses help students strengthen their academic background so that they can successfully undertake the subjects included in the degree program. These courses are open access, free of charge, and have no fixed start or end dates. The Level 0 Mathematics courses are particularly recommended. Students are advised to complete them before the beginning of the academic year.

PROYECTO FIN DE GRADO

The Bachelor’s Degree in Artificial Intelligence Engineering aims to provide students with a set of skills focused on technically preparing them to practice their profession with the guarantees required by society. Degree curricula are designed to guide students through the process necessary to achieve this objective appropriately, enabling them to gain the social trust and professional recognition associated with university education. This process requires knowledge of a theoretical body of concepts and mastery of a set of techniques specific to the field of Artificial Intelligence. Among other competencies, students must acquire the ability to design, implement, and evaluate the quality of computational tools, as well as the production, implementation, and development processes associated with them. In this regard, the completion of a final project is considered an invaluable component that culminates the student’s educational process.

The establishment of a Bachelor’s Thesis (hereinafter, BT) fulfills this role and is based both on the educational justification described above and on the standard practice within engineering degrees. The BT is compulsory and carries a workload of 12 ECTS credits, as defined in the curriculum of the Bachelor’s Degree in Artificial Intelligence Engineering of the Higher Technical School of Computer Engineering, which establishes it as a requirement for obtaining the degree. The curriculum stipulates that the BT may only be defended once all courses in the degree program have been successfully completed, with the exception of the thesis itself.

With regard to its definition, the BT consists of an individual project whose completion and subsequent public defense must demonstrate that the student is capable of rigorously and methodically applying the knowledge acquired throughout the degree, assessing and selecting the necessary tools to carry out the proposed development, and demonstrating the technical and creative skills expected of a professional in Artificial Intelligence. Certification that these conditions have been met by each student presenting the project will be the responsibility of an Evaluation Committee appointed for this purpose.
More information at the following link

SUGERENCIAS, RECLAMACIONES Y FELICITACIONES

Suggestions, complaints, or commendations must include the identification of the interested party (name and national ID number), as well as the degree program, course, service, or type of studies to which they refer, through this electronic form.
Acknowledgment of receipt of the message will be sent within the following 24 working hours, and the average response time is two working days (however, in accordance with the Quality Assurance System approved for UNED by ANECA, the maximum response period is 20 days).

GENDER EQUALITY

Consistent with the assumed value of gender equality, all the denominations that in this Guide refer to single-person, representative, or members of the university community and are made in the masculine gender, when they have not been replaced by terms generic, shall be understood as interchangeably in female or male gender, depending on the sex of the holder who performs them.