



Regulation, Safety and Ethics of Artificial Intelligence in Pharmaceuticals

» Modality: online

» Duration: 6 weeks

» Certificate: TECH Global University

» Credits: 6 ECTS

» Schedule: at your own pace

» Exams: online

Website: www.techtitute.com/us/pharmacy/postgraduate-certificate/regulation-safety-ethics-artificial-intelligence-pharmaceuticals

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# tech 06 | Introduction

The implementation of Artificial Intelligence in Pharma has revolutionized critical processes, such as drug production, distribution logistics and clinical data analysis. However, this technological advance requires a solid framework of regulation, safety and ethics to ensure that its use is responsible, transparent and safe. Therefore, addressing these aspects is not only a current need, but a priority to ensure that technological advances are aligned with the fundamental values of public health and social welfare.

Against this backdrop, TECH has devised this Postgraduate Certificate in Regulation, Safety and Ethics of AI in Pharmacy, which will offer a unique opportunity to acquire specialized knowledge in an area of growing relevance, providing professionals with tools to understand and apply the regulatory frameworks that govern this technology. Among the main features of the program, it will highlight its comprehensive and practical approach, designed to help them understand how to ensure safety and transparency in the use of AI within Pharmacy. They will also know how to identify risks, apply ethical solutions and manage in a highly digitized pharmaceutical environment.

From this, graduates will not only broaden their employment horizons, but will also be prepared to take on strategic roles in projects where AI is key. In this sense, they will stand out in multidisciplinary teams, adding value to their organizations and contributing to the improvement of processes in the pharmaceutical industry. Specializing in these aspects will represent an immediate benefit and a long-term investment.

Likewise, the 100% online modality will offer experts high quality knowledge, with the flexibility they need to combine their training with their professional practice. In turn, this curriculum will be structured under the innovative Relearning methodology, an academic technique that allows the assimilation of knowledge in a progressive and natural way, through the repetition of key concepts in different contexts, favoring a solid and lasting understanding.

This Postgraduate Certificate in Regulation, Safety and Ethics of Artificial Intelligence in Pharmaceuticals contains the most complete and up-to-date scientific program on the market. The most important features include:

- The development of case studies presented by experts with a deep mastery of Regulation, Safety and Ethics of Artificial Intelligence in Pharmaceuticals
- The graphic, schematic and eminently practical content of the book provides scientific and practical information on those disciplines that are essential for professional practice
- Practical exercises where the process of self-assessment can be used to improve learning
- Its special emphasis on innovative methodologies
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection



Do you want to study without compromising your life rhythm or your work responsibilities? At TECH, you will benefit from a methodology that maximizes your time and enhances your learning"



Take ethics and safety to the next level! You will be able to regulate Artificial Intelligence in Pharmacy with an online program that will prepare you to lead technological innovation in a responsible way"

The program's teaching staff includes professionals from the field who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive education programmed to learn in real situations.

This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise during the course. For this purpose, students will be assisted by an innovative interactive video system created by renowned experts.

You will discover how to apply key Al regulations in the pharmaceutical sector, from a teaching staff that combines extensive academic and professional experience. With all TECH's quality guarantees!

Your future will be aligned with technology! With TECH, you will specialize in regulation, safety and ethics of AI in Pharmacy, standing out in a market that seeks professionals committed to innovation.







# tech 10 | Why Study at TECH?

#### The world's best online university, according to FORBES

The prestigious Forbes magazine, specialized in business and finance, has highlighted TECH as "the best online university in the world" This is what they have recently stated in an article in their digital edition in which they echo the success story of this institution, "thanks to the academic offer it provides, the selection of its teaching staff, and an innovative learning method oriented to form the professionals of the future".

#### The best top international faculty

TECH's faculty is made up of more than 6,000 professors of the highest international prestige. Professors, researchers and top executives of multinational companies, including Isaiah Covington, performance coach of the Boston Celtics; Magda Romanska, principal investigator at Harvard MetaLAB; Ignacio Wistumba, chairman of the department of translational molecular pathology at MD Anderson Cancer Center; and D.W. Pine, creative director of TIME magazine, among others.

#### The world's largest online university

TECH is the world's largest online university. We are the largest educational institution, with the best and widest digital educational catalog, one hundred percent online and covering most areas of knowledge. We offer the largest selection of our own degrees and accredited online undergraduate and postgraduate degrees. In total, more than 14,000 university programs, in ten different languages, making us the largest educational institution in the world.



The most complete syllabus





World's
No.1
The World's largest
online university

#### The most complete syllabuses on the university scene

TECH offers the most complete syllabuses on the university scene, with programs that cover fundamental concepts and, at the same time, the main scientific advances in their specific scientific areas. In addition, these programs are continuously updated to guarantee students the academic vanguard and the most demanded professional skills. and the most in-demand professional competencies. In this way, the university's qualifications provide its graduates with a significant advantage to propel their careers to success.

#### A unique learning method

TECH is the first university to use Relearning in all its programs. This is the best online learning methodology, accredited with international teaching quality certifications, provided by prestigious educational agencies. In addition, this innovative academic model is complemented by the "Case Method", thereby configuring a unique online teaching strategy. Innovative teaching resources are also implemented, including detailed videos, infographics and interactive summaries.

#### The official online university of the NBA

TECH is the official online university of the NBA. Thanks to our agreement with the biggest league in basketball, we offer our students exclusive university programs, as well as a wide variety of educational resources focused on the business of the league and other areas of the sports industry. Each program is made up of a uniquely designed syllabus and features exceptional guest hosts: professionals with a distinguished sports background who will offer their expertise on the most relevant topics.

#### **Leaders in employability**

TECH has become the leading university in employability. Ninety-nine percent of its students obtain jobs in the academic field they have studied within one year of completing any of the university's programs. A similar number achieve immediate career enhancement. All this thanks to a study methodology that bases its effectiveness on the acquisition of practical skills, which are absolutely necessary for professional development.







99% maximun employability guaranteed

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#### **Google Premier Partner**

The American technology giant has awarded TECH the Google Premier Partner badge. This award, which is only available to 3% of the world's companies, highlights the efficient, flexible and tailored experience that this university provides to students. The recognition not only accredits the maximum rigor, performance and investment in TECH's digital infrastructures, but also places this university as one of the world's leading technology companies.

#### The top-rated university by its students

Students have positioned TECH as the world's top-rated university on the main review websites, with a highest rating of 4.9 out of 5, obtained from more than 1,000 reviews. These results consolidate TECH as the benchmark university institution at an international level, reflecting the excellence and positive impact of its educational model.





# tech 14 | Syllabus

## Module 1. Regulation, Safety and Ethics of Artificial Intelligence in Pharmaceuticals

- 1.1. Al Regulations for Pharmaceutical Products
  - 1.1.1. Introduction to Regulatory Standards in Al Applied to Health Care
  - 1.1.2. Main Regulatory Agencies (FDA, EMA) and Their Role in Al
  - 1.1.3. Standards for the Approval of Al Technologies in Pharmaceuticals
  - 1.1.4. Examples of Al Software Certification for Healthcare Products
- 1.2. Healthcare Al Regulatory Compliance
  - 1.2.1. Key Concepts in Al Regulatory Compliance
  - 1.2.2. Legal Requirements for the Development of Al in Pharmacy
  - 1.2.3. Al Audits to Ensure Regulatory Compliance
  - 1.2.4. Examples of Al Compliance under the European MDR
- 1.3. Data Security in Al Applications
  - 1.3.1. Introduction to Data Security in the Healthcare Environment
  - 1.3.2. Security Protocols for the Storage of Medical Data
  - 1.3.3. Al for Threat Detection and Data Protection
  - 1.3.4. Microsoft Azure Tools for Secure Data Management
- 1.4. Privacy and Ethics in Al Applications
  - 1.4.1. Ethical Concepts in Patient Data Management
  - 1.4.2. Responsible Al and Privacy Principles in Pharmacy
  - 1.4.3. Tools for Anonymization of Sensitive Data
  - 1.4.4. Examples of Privacy in Google Health
- 1.5. Transparency of Algorithms in Al for Health
  - 1.5.1. Importance of Transparency in Al Applied to Health
  - 1.5.2. Explainability of Algorithms and Their Interpretation in Healthcare
  - 1.5.3. Methods to Ensure Transparency in Al Models
  - 1.5.4. Application of IBM Explainable AI for Healthcare
- 1.6. Avoiding Biases in Al Systems
  - 1.6.1. Identification of Biases in Medical and Pharmaceutical Data
  - 1.6.2. Techniques for Minimizing Bias in Al Algorithms
  - 1.6.3. Examples of Common Biases in Al for Pharmaceuticals
  - 1.6.4. Use of Google's Fairness Toolkit to Reduce Biases





# Syllabus | 15 tech

- 1.7. Auditing Al Systems in Pharmacy
  - 1.7.1. Concept and Objectives of Al Auditing in Health Care
  - 1.7.2. Audit Methods to Validate Al Systems
  - 1.7.3. Audit Criteria to Ensure Quality and Ethics
  - 1.7.4. Example of an Al Audit with TÜV SÜD
- 1.8. Informed Consent in Al Health Data
  - 1.8.1. Importance of Consent in the Use of Personal Data
  - 1.8.2. Al Tools for Informed Consent Management
  - 1.8.3. Al in Obtaining and Secure Storage of Consents
  - 1.8.4. Example of Consent Management in Epic Systems
- 1.9. Al for Pharmacy Fraud Detection
  - 1.9.1. Impact of Fraud in the Pharmaceutical Industry
  - 1.9.2. Al Algorithms for Identification of Fraudulent Activities
  - 1.9.3. Al in the Prevention of Counterfeiting and Illegal Sale of Pharmaceuticals
  - 1.9.4. Example of SAS Fraud Framework for Healthcare
- 1.10. Responsibility and Accountability in Al
  - 1.10.1. Concept of Accountability in Al Applications
  - 1.10.2. Definition of Roles and Responsibilities in Al for Health Care
  - 1.10.3. Al for Tracking Decisions and Actions in Healthcare Processes
  - 1.10.4. Initiatives such as Partnership on AI for Accountability Guidelines



You will live a flexible academic experience that adapts to your needs, acquiring the necessary tools to perform successfully in a pharmaceutical sector in constant innovation and regulation"



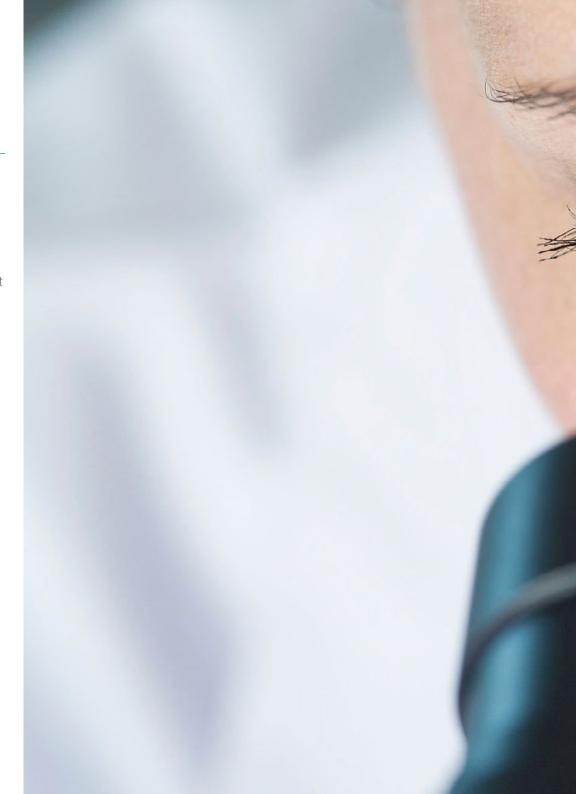


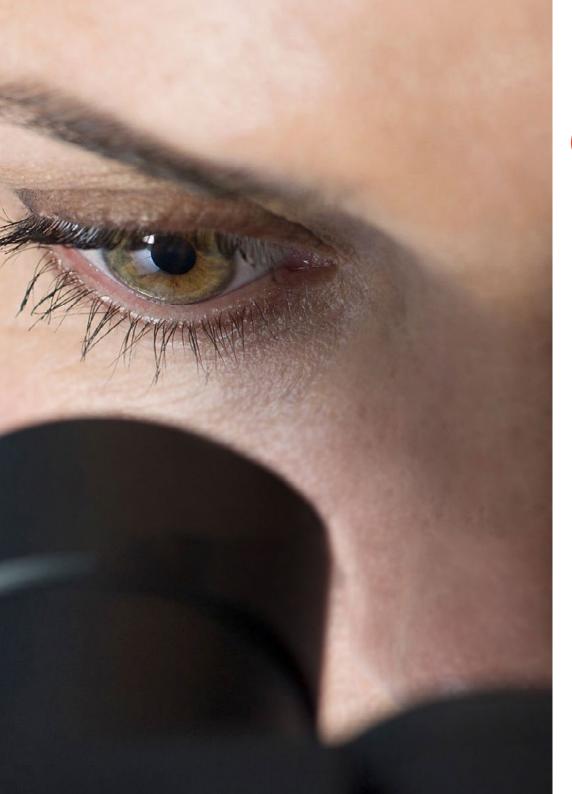
# tech 18 | Teaching Objectives



## **General Objectives**

- Understand the fundamentals of artificial intelligence (AI) and its application in the pharmaceutical industry
- Analyze international regulations governing the development and use of Al in the pharmaceutical industry
- Evaluate the risks and benefits associated with the use of AI in drug research, development and production
- Develop skills to design and evaluate safe, reliable, and ethical AI systems in the pharmaceutical context
- Identify ethical challenges posed by AI in healthcare, such as data privacy and equity in access to the technology
- Propose innovative solutions to ensure the safety and efficacy of pharmaceuticals developed with AI
- Collaborate in multidisciplinary teams to address ethical and regulatory challenges of AI in healthcare
- Effectively communicate knowledge gained about AI in pharmaceuticals to different audiences, including healthcare professionals, regulators, and the general public





# Teaching Objectives | 19 tech



# **Specific Objectives**

- Understand pharmaceutical AI regulations and regulations governing the use of AI in the pharmaceutical industry
- Ensure the safety of AI systems in pharmacy and develop strategies to ensure the safe use of Artificial Intelligence in pharmaceutical processes
- Assess ethical risks in the implementation of AI, analyzing the ethical implications of the use of AI in pharmaceutical decision making
- Apply regulatory practices in developing Al solutions, implementing safety and quality regulations in the design of Al-based technologies in pharmacy



Do you want to boost your career growth? TECH will propel you to fulfill your purpose with this high-level program. Enroll now and stand out in the field of AI in Pharmacy!"



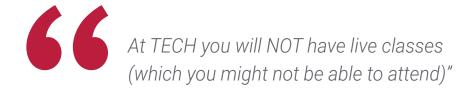


## The student: the priority of all TECH programs

In TECH's study methodology, the student is the main protagonist.

The teaching tools of each program have been selected taking into account the demands of time, availability and academic rigor that, today, not only students demand but also the most competitive positions in the market.

With TECH's asynchronous educational model, it is students who choose the time they dedicate to study, how they decide to establish their routines, and all this from the comfort of the electronic device of their choice. The student will not have to participate in live classes, which in many cases they will not be able to attend. The learning activities will be done when it is convenient for them. They can always decide when and from where they want to study.







## The most comprehensive study plans at the international level

TECH is distinguished by offering the most complete academic itineraries on the university scene. This comprehensiveness is achieved through the creation of syllabi that not only cover the essential knowledge, but also the most recent innovations in each area.

By being constantly up to date, these programs allow students to keep up with market changes and acquire the skills most valued by employers. In this way, those who complete their studies at TECH receive a comprehensive education that provides them with a notable competitive advantage to further their careers.

And what's more, they will be able to do so from any device, pc, tablet or smartphone.



TECH's model is asynchronous, so it allows you to study with your pc, tablet or your smartphone wherever you want, whenever you want and for as long as you want"

# tech 24 | Study Methodology

#### Case Studies and Case Method

The case method has been the learning system most used by the world's best business schools. Developed in 1912 so that law students would not only learn the law based on theoretical content, its function was also to present them with real complex situations. In this way, they could make informed decisions and value judgments about how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

With this teaching model, it is students themselves who build their professional competence through strategies such as Learning by Doing or Design Thinking, used by other renowned institutions such as Yale or Stanford.

This action-oriented method will be applied throughout the entire academic itinerary that the student undertakes with TECH. Students will be confronted with multiple real-life situations and will have to integrate knowledge, research, discuss and defend their ideas and decisions. All this with the premise of answering the question of how they would act when facing specific events of complexity in their daily work.



## Relearning Methodology

At TECH, case studies are enhanced with the best 100% online teaching method: Relearning.

This method breaks with traditional teaching techniques to put the student at the center of the equation, providing the best content in different formats. In this way, it manages to review and reiterate the key concepts of each subject and learn to apply them in a real context.

In the same line, and according to multiple scientific researches, reiteration is the best way to learn. For this reason, TECH offers between 8 and 16 repetitions of each key concept within the same lesson, presented in a different way, with the objective of ensuring that the knowledge is completely consolidated during the study process.

Relearning will allow you to learn with less effort and better performance, involving you more in your specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to success.



# tech 26 | Study Methodology

## A 100% online Virtual Campus with the best teaching resources

In order to apply its methodology effectively, TECH focuses on providing graduates with teaching materials in different formats: texts, interactive videos, illustrations and knowledge maps, among others. All of them are designed by qualified teachers who focus their work on combining real cases with the resolution of complex situations through simulation, the study of contexts applied to each professional career and learning based on repetition, through audios, presentations, animations, images, etc.

The latest scientific evidence in the field of Neuroscience points to the importance of taking into account the place and context where the content is accessed before starting a new learning process. Being able to adjust these variables in a personalized way helps people to remember and store knowledge in the hippocampus to retain it in the long term. This is a model called Neurocognitive context-dependent e-learning that is consciously applied in this university qualification.

In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

Likewise, this very complete Virtual Campus will allow TECH students to organize their study schedules according to their personal availability or work obligations. In this way, they will have global control of the academic content and teaching tools, based on their fast-paced professional update.



The online study mode of this program will allow you to organize your time and learning pace, adapting it to your schedule"

## The effectiveness of the method is justified by four fundamental achievements:

- 1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that assess real situations and the application of knowledge.
- **2.** Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
- 3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
- 4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.

# Study Methodology | 27 tech

## The university methodology top-rated by its students

The results of this innovative teaching model can be seen in the overall satisfaction levels of TECH graduates.

The students' assessment of the teaching quality, the quality of the materials, the structure of the program and its objectives is excellent. Not surprisingly, the institution became the top-rated university by its students according to the global score index, obtaining a 4.9 out of 5.

Access the study contents from any device with an Internet connection (computer, tablet, smartphone) thanks to the fact that TECH is at the forefront of technology and teaching.

You will be able to learn with the advantages that come with having access to simulated learning environments and the learning by observation approach, that is, Learning from an expert.

As such, the best educational materials, thoroughly prepared, will be available in this program:



#### **Study Material**

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.



## **Practicing Skills and Abilities**

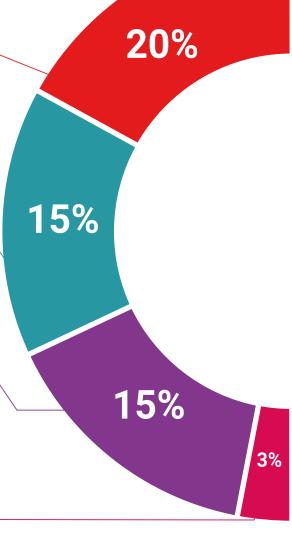
You will carry out activities to develop specific competencies and skills in each thematic field. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop within the framework of the globalization we live in.



#### **Interactive Summaries**

We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".





### **Additional Reading**

Recent articles, consensus documents, international guides... In our virtual library you will have access to everything you need to complete your education.



Students will complete a selection of the best case studies in the field. Cases that are presented, analyzed, and supervised by the best specialists in the world.

## **Testing & Retesting**



We periodically assess and re-assess your knowledge throughout the program. We do this on 3 of the 4 levels of Miller's Pyramid.

#### **Classes**



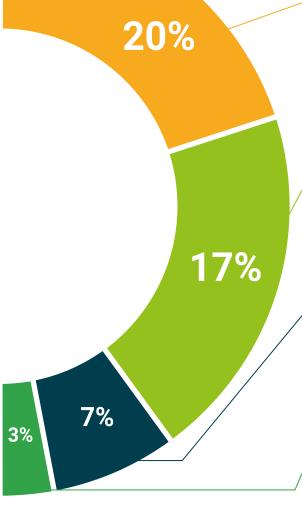
There is scientific evidence suggesting that observing third-party experts can be useful.

Learning from an expert strengthens knowledge and memory, and generates confidence for future difficult decisions.

#### **Quick Action Guides**



TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical and effective way to help students progress in their learning.







# tech 32 | Teaching Staff

## Management



## Dr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometeus Global Solutions
- CTO at Korporate Technologies
- CTO at AI Shepherds GmbH
- Consultant and Strategic Business Advisor at Alliance Medical
- Director of Design and Development at DocPath
- Doctorate in Psychology from the University of Castilla La Mancha
- Doctorate in Economics, Business and Finance from the Camilo José Cela University
- Doctorate in Psychology from University of Castilla La Mancha
- Master's Degree in Executive MBA from the Isabel I University
- Master's Degree in Sales and Marketing Management from the Isabel I University
- Expert Master's Degree in Big Data by Hadoop Training
- Master's Degree in Advanced Information Technologies from the University of Castilla La Mancha
- Member of the research group SMILE

## **Professors**

## Mr. Popescu Radu, Daniel Vasile

- Independent Specialist in Pharmacology, Nutrition and Dietetics
- Freelance Producer of Didactic and Scientific Content
- Nutritionist and Community Dietitian
- Community Pharmacist
- Researcher
- Master's Degree in Nutrition and Health from the Open University of Catalonia
- Master's Degree in Psychopharmacology from the University of Valencia
- Pharmacist from the Complutense University of Madrid
- Nutritionist-Dietitian by the European University Miguel de Cervantes

#### Mr. Del Rey Sánchez, Alejandro

- In Charge of Implementing Programs to Improve Tactical Emergency Care
- Degree in Industrial Organization Engineering
- Certification in Big Data and Business Analytics
- Certification in Microsoft Excel Advanced, VBA, KPI and DAX
- Certification in CIS Telecommunication and Information Systems

### Ms. Del Rey Sánchez, Cristina

- Talent Management Administrator at Securitas Seguridad España, S.L
- Extracurricular Activities Center Coordinator
- Tutor and pedagogical interventions with Primary and Secondary Education students
- Postgraduate in Development, Delivery and Tutoring of e-Learning Training Actions
- Postgraduate in Early Childhood Care
- Degree in Pedagogy from the Complutense University of Madrid

## Mr. Martín-Palomino Sahagún, Fernando

- Chief Technology Officer and R+D+i Director at AURA Diagnostics (medTech)
- Business Development at SARLIN
- Chief Operating Officer at Alliance Diagnostics
- Director of Innovation at Alliance Medical
- Chief Information Officer at Alliance Medical
- Field Engineer & Project Management in Digital Radiology at Kodak
- MBA from the Polytechnic University of Madrid
- Executive Master's Degree in Marketing and Sales at ESADE
- Telecommunications Engineer from the University Alfonso X El Sabio

#### Dr. Carrasco González, Ramón Alberto

- Head of Business Intelligence (Marketing) at the Caja General de Ahorros de Granada and Banco Mare Nostrum
- Head of Information Systems (Data Warehousing and Business Intelligence) at Caja General de Ahorros de Granada and Banco Mare Nostrum
- Computer Science and Artificial Intelligence Specialist and Researcher
- Doctorate in Artificial Intelligence from the University of Granada
- Senior Engineer in Computer Science from the University of Granada



Take the opportunity to learn about the latest advances in this field in order to apply it to your daily practice"





# tech 36 | Certificate

This private qualification will allow you to obtain a **Postgraduate Certificate in Regulation**, **Safety and Ethics of Artificial Intelligence in Pharmaceuticals** endorsed by **TECH Global University**, the world's largest online university.

**TECH Global University** is an official European University publicly recognized by the Government of Andorra (*official bulletin*). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** private qualification is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: Postgraduate Certificate in Regulation, Safety and Ethics of Artificial Intelligence in Pharmaceuticals

Modality: online

Duration: 6 weeks

Accreditation: 6 ECTS



Mr./Ms. \_\_\_\_\_, with identification document \_\_\_\_ has successfully passed and obtained the title of:

# Postgraduate Certificate in Regulation, Safety and Ethics of Artificial Intelligence in Pharmaceuticals

This is a private qualification of 180 hours of duration equivalent to 6 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024



health confidence people health information tutors education information teaching guarantee accreditation teaching institutions technology learning



# Postgraduate Certificate

Regulation, Safety and Ethics of Artificial Intelligence in Pharmaceuticals

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Global University
- » Credits: 6 ECTS
- » Schedule: at your own pace
- » Exams: online

