

# Postgraduate Certificate

## Ethical Aspects of Artificial Intelligence in Clinical Research





## Postgraduate Certificate Ethical Aspects of Artificial Intelligence in Clinical Research

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

Website: [www.techtute.com/us/artificial-intelligence/postgraduate-certificate/ethical-aspects-artificial-intelligence-clinical-research](http://www.techtute.com/us/artificial-intelligence/postgraduate-certificate/ethical-aspects-artificial-intelligence-clinical-research)

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# 01

# Introduction

Ethical Aspects in the integration of Artificial Intelligence (AI) in Clinical Research are fundamental to ensure that the application of these technologies is carried out in a responsible manner and benefits society in general. For this reason, clinicians have a responsibility to protect the privacy of user data by ensuring that the various privacy regulations are complied with. It should also be noted that individuals must give their informed consent for their information to be used in research involving Machine Learning. In view of this, TECH has implemented a program dedicated to addressing security challenges in the handling of sensitive data. And all in a convenient 100% online format.





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*The incorporation of ethical considerations in your daily practice will drive more ethical and responsible medical advances”*

Artificial Intelligence is a key element in driving sustainability in biomedical research. Its tools reduce the need to use large amounts of physical resources (such as laboratory materials and reagents) by optimizing sample selection. Therefore, this contributes to the conservation of the environment by reducing waste and the consumption of natural elements. In this sense, Artificial Intelligence facilitates procedures based on remote medical care, which reduces the need to travel and, therefore, contributes to the reduction of carbon emissions related to transportation.

In this context, TECH is developing a Postgraduate Certificate that will delve into the challenges of sustainability in biomedical research. The curriculum will delve into environmental impact assessment and resources related to the application of Artificial Intelligence in these analyses. In addition, the syllabus will offer numerous proposals for sustainable practices in the integration of Machine Learning technologies in healthcare research projects. Throughout the program, the didactic contents will promote among the experts an ethical awareness to manage the materials and demonstrate their social responsibility.

It should be noted that the methodology of this university reinforces its innovative character. TECH offers a 100% online learning environment, adapted to the needs of busy professionals seeking to advance their careers. In addition, it will employ the *Relearning* methodology, based on the repetition of key concepts to fix knowledge and facilitate learning. In this way, the combination of flexibility and a robust pedagogical approach makes it highly accessible. The only requirement is that professionals have a device with Internet access, including their own cell phone. In this way, they will be able to enter the Virtual Campus to enjoy an educational experience that will raise their work horizons to a higher level.

This **Postgraduate Certificate in Ethical Aspects of Artificial Intelligence in Clinical Research** contains the most complete and up-to-date educational program on the market. Its most notable features are:

- ♦ Development of practical cases presented by experts in ethical aspects of AI Technologies Clinical Practice
- ♦ The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice.
- ♦ Practical exercises where 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



*You will delve into the management of informed consent and responsibility in research, in the context of advanced technologies in the biomedical field.”*

“

*You will be able to merge technological innovation with an unwavering commitment to ethics and integrity in medical settings.”*

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 academic year. For this purpose, the students will be assisted by an innovative interactive video system created by renowned and experienced experts.

*Thanks to this Postgraduate Certificate, you will ethically address current challenges and anticipate the evolving landscape of Clinical Research.*

*A curriculum tailored to your needs and designed under the most effective teaching methodology: Relearning.*



# 02

# Objectives

Through this university program, graduates will acquire a solid and contextualized understanding of the ethical dilemmas that arise when implementing Artificial Intelligence in the medical field. After comprehensively addressing both deontological and specific legal challenges, experts will implement effective strategies to make sound ethical decisions. Similarly, professionals will ensure the protection of confidential data, the management of informed consent and fairness in access to medical care. In addition, they will carry out both innovation and entrepreneurship processes to provide efficient solutions.





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*You will apply sound ethical principles to Artificial Intelligence in Clinical Research, contributing to fairer, more transparent and socially responsible medical advances.”*



## General Objective

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- Delve into ethical dilemmas, review legal considerations, explore the socioeconomic and future impact of AI in healthcare, and promote innovation and entrepreneurship in the field of clinical AI

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*It includes clinical cases to bring the program as close as possible to the reality of medical care”*





## Specific Objectives

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- Understand the ethical dilemmas that arise when applying AI in clinical research and review the relevant legal and regulatory considerations in the biomedical field
- Address specific challenges in the management of informed consent in AI studies
- Investigate how AI can influence equity and access to health care
- Analyze future perspectives on how AI will shape Clinical Research, exploring its role in the sustainability of biomedical research practices and identifying opportunities for innovation and entrepreneurship
- Comprehensively address the ethical, legal and socioeconomic aspects of AI-driven Clinical Research

03

# Course Management

In tune with its commitment to offer educational maximum excellence, TECH has a prestigious teaching staff. These specialists have an extensive work background, having been part of renowned health centers. Thanks to this, they are defined by having a deep knowledge of Artificial Intelligence in Clinical Research and are aware of the advances that have occurred in this field during the last decades. In this way, physicians have the guarantees they require to keep up to date in a profession that is constantly advancing.



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*Learn with the best! The diversity of talents and knowledge of the faculty will create an enriching learning environment”*

## Management



### **Dr. Peralta Martín-Palomino, Arturo**

- ♦ CEO and CTO at Prometheus 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
- ♦ Ph.D. in Psychology from the University of Castilla - La Mancha
- ♦ Ph.D. in Economics, Business and Finance from the Camilo José Cela University
- ♦ Ph.D. in Psychology from University of Castilla – La Mancha
- ♦ Master's in Executive MBA por la Universidad Isabel I
- ♦ Master's Degree in Sales and Marketing Management, 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: SMILE Research Group



### Mr. Popescu Radu, Daniel Vasile

- ♦ Pharmacology, Nutrition and Diet Specialist
- ♦ Freelance Producer of Didactic and Scientific Contents
- ♦ Nutritionist and Community Dietitian
- ♦ Community Pharmacist
- ♦ Researcher
- ♦ Master's Degree in Nutrition and Health at the Universidad Oberta de Catalunya
- ♦ Master's Degree in Psychopharmacology, University of Valencia
- ♦ Pharmacist by the Complutense University of Madrid
- ♦ Nutritionist-Dietician by the European University Miguel de Cervantes

## Professors

### Dr. Carrasco González, Ramón Alberto

- ♦ Computer Science and Artificial Intelligence Specialist
- ♦ Researcher
- ♦ Head of *Business Intelligence* (Marketing) at 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.
- ♦ PhD in Artificial Intelligence, University of Granada
- ♦ Computer Engineer from the University of Granada

# 04

## Structure and Content

This university program brings together the conceptual depth with the practical applicability of Artificial Intelligence in Clinical Research. The academic itinerary will analyze in detail the main ethical dilemmas to which professionals are subjected during the exercise of their profession. Likewise, the syllabus will delve from the moral foundations to the legal implications, allowing graduates to become aware of the consequences of their actions. The program will also include the study of real-life case studies, so that experts will learn valuable lessons in simulated learning environments.





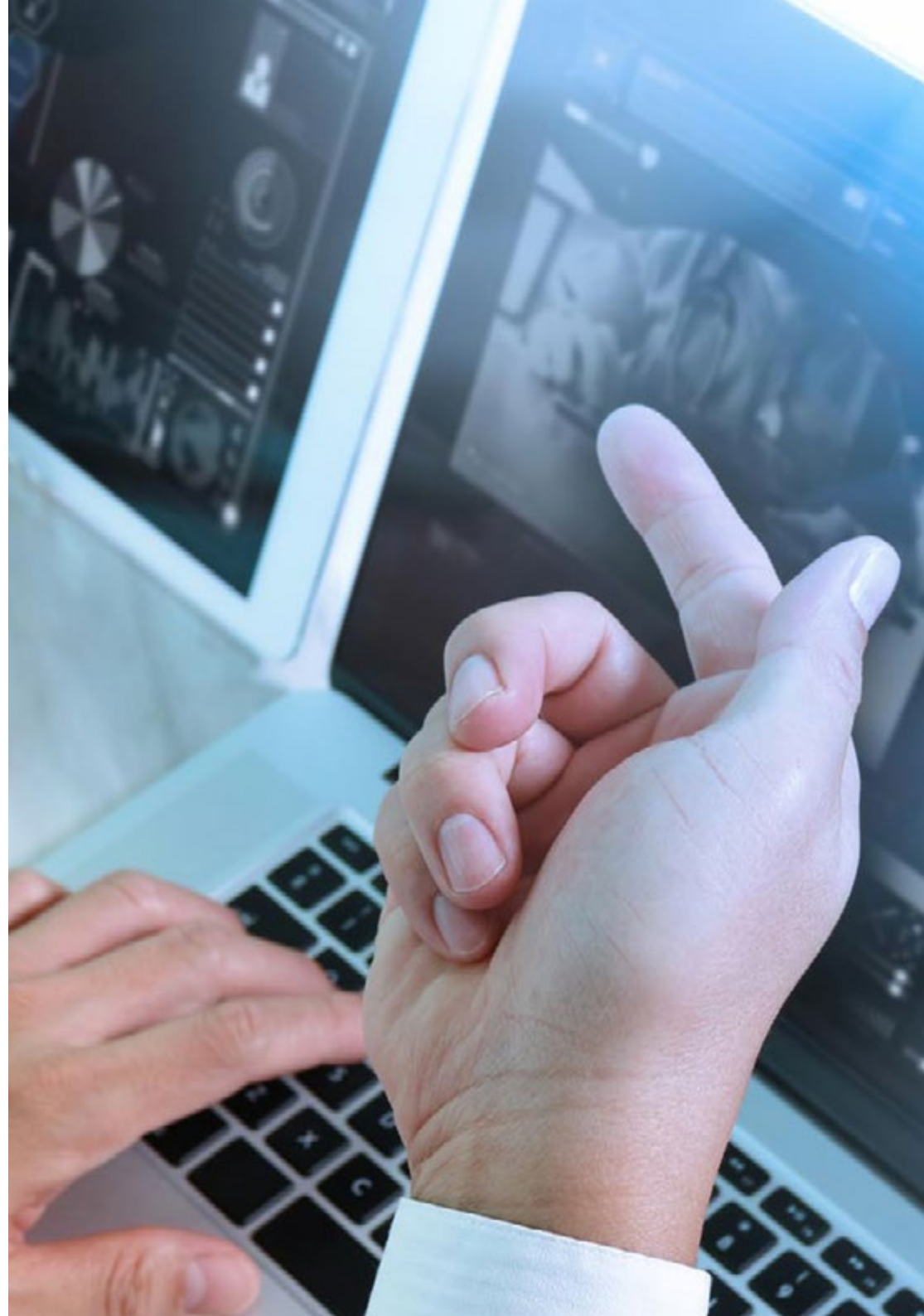


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*You will be equipped with the most advanced tools to overcome emerging ethical and legal dilemmas in the use of Machine Learning in clinical settings.”*

## Module 1. Ethical, Legal and Future Aspects of AI in Clinical Research

- 1.1. Ethics in the Application of AI in Clinical Research
  - 1.1.1. Ethical Analysis of AI-assisted Decision Making in Clinical Research Settings
  - 1.1.2. Ethics in the Use of AI Algorithms for Participant Selection in Clinical Studies
  - 1.1.3. Ethical Considerations in the Interpretation of Results Generated by AI Systems in Clinical Research
- 1.2. Legal and Regulatory Considerations in Biomedical AI
  - 1.2.1. Analysis of Legal Regulations in the Development and Application of AI Technologies in the Biomedical Field
  - 1.2.2. Assessment of Compliance with Specific Regulations to Ensure the Safety and Efficacy of AI-based Solutions
  - 1.2.3. Addressing Emerging Regulatory Challenges Associated with the Use of AI in Biomedical Research
- 1.3. Informed Consent and Ethical Aspects in the Use of Clinical Data.
  - 1.3.1. Developing Strategies to Ensure Effective Informed Consent in Projects Involving AI
  - 1.3.2. Ethics in the Collection and Use of Sensitive Clinical Data in the Context of AI-driven Research
  - 1.3.3. Addressing Ethical Issues Related to Ownership of and Access to Clinical Data in Research Projects
- 1.4. AI and Accountability in Clinical Research
  - 1.4.1. Assessing Ethical and Legal Liability in the Implementation of AI Systems in Clinical Research Protocols
  - 1.4.2. Development of Strategies to Address Potential Adverse Consequences of AI Implementation in Biomedical Research
  - 1.4.3. Ethical Considerations in the Active Involvement of AI in Clinical Research Decision Making



- 1.5. Impact of AI on Equity and Access to Health Care
  - 1.5.1. Evaluation of the Impact of AI Solutions on Equity in Clinical Trial Participation
  - 1.5.2. Developing Strategies to Improve Access to AI Technologies in Diverse Clinical Settings
  - 1.5.3. Ethics in the Distribution of Benefits and Risks Associated with the Application of AI in Health Care
- 1.6. Privacy and Data Protection in Research Projects
  - 1.6.1. Assurance of Privacy of Participants in Research Projects Involving the Use of AI
  - 1.6.2. Development of Policies and Practices for Data Protection in Biomedical Research
  - 1.6.3. Addressing Specific Privacy and Security Challenges in the Handling of Sensitive Data in the Clinical Environment
- 1.7. AI and Sustainability in Biomedical Research
  - 1.7.1. Assessing the Environmental Impact and Resources Associated with the Implementation of AI in Biomedical Research
  - 1.7.2. Development of Sustainable Practices in the Integration of AI Technologies in Clinical Research Projects
  - 1.7.3. Ethics in Resource Management and Sustainability in the Adoption of AI in Biomedical Research
- 1.8. Auditing and Explainability of AI Models in the Clinical Setting
  - 1.8.1. Development of Audit Protocols for Assessing the Reliability and Accuracy of AI Models in Clinical Research
  - 1.8.2. Ethics in the Explainability of Algorithms to Ensure Understanding of Decisions Made by AI Systems in Clinical Contexts
  - 1.8.3. Addressing Ethical Challenges in Interpreting Results of AI Models in Biomedical Research
- 1.9. Innovation and Entrepreneurship in the field of Clinical AI
  - 1.9.1. Ethics in Responsible Innovation When Developing AI Solutions for Clinical Applications
  - 1.9.2. Development of Ethical Business Strategies in the Field of Clinical AI
  - 1.9.3. Ethical Considerations in the Commercialization and Adoption of AI Solutions in the Clinical Sector
- 1.10. Ethical Considerations in International Clinical Research Collaboration
  - 1.10.1. Development of Ethical and Legal Agreements for International Collaboration in AI-driven Research Projects
  - 1.10.2. Ethics in Multi-Institution and Multi-Country Involvement in Clinical Research with AI Technologies
  - 1.10.3. Addressing Emerging Ethical Challenges Associated with Global Biomedical Research Collaborations



*Enjoy the most up-to-date educational content available in innovative multimedia formats to optimize your studies"*

05

# Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning**.

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.





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*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

## Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

“

*At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world”*



*You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.*



*The student will learn to solve complex situations in real business environments through collaborative activities and real cases.*

### A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

“*Our program prepares you to face new challenges in uncertain environments and achieve success in your career”*

The case method has been the most widely used learning system among the world's leading Information Technology schools for as long as they have existed. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the course, students will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

## Relearning Methodology

TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

*In 2019, we obtained the best learning results of all online universities in the world.*

At TECH you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.





In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

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

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.



This program offers the best educational material, prepared with professionals in mind:



### 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.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.



### 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 in future difficult decisions.



### Practising Skills and Abilities

They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



### Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





#### Case Studies

Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best specialists in the world.



#### Interactive Summaries

The TECH team presents 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".



#### Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.



06

# Certificate

The Postgraduate Certificate in Ethical Aspects of Artificial Intelligence in Clinical Research guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.



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*Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"*

This program will allow you to obtain your **Postgraduate Certificate in Ethical Aspects of Artificial Intelligence in Clinical Research** 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** title 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 Ethical Aspects of Artificial Intelligence in Clinical Research**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



\*Apostille Convention. In the event that the student wishes to have their paper certificate issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.



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