

# Postgraduate Certificate

## Practical Applications of Artificial Intelligence in Dentistry



## Postgraduate Certificate Practical Applications of Artificial Intelligence in Dentistry

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

Website: [www.techtute.com/us/dentistry/postgraduate-certificate/practical-applications-artificial-intelligence-dentistry](http://www.techtute.com/us/dentistry/postgraduate-certificate/practical-applications-artificial-intelligence-dentistry)

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# 01

# Introduction

The manufacture of Orthodontic Splints and Aligners using 3D technology with Artificial Intelligence (AI) is crucial in the field of Dentistry. Its importance lies in the fact that it drives the creation of highly customized instruments. Each device is tailored specifically to the patient's mouth, which improves treatment efficiency and reduces discomfort issues. AI also decreases the possibility of human error in the design and fabrication of materials, ensuring consistency. This way, users experience faster results in their orthodontic therapies, which increases their level of satisfaction. For this reason, TECH is developing an online university program that will address the use of 3D printing to create individualized dental prostheses.







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*Delve into the use of robotics in dental procedures thanks to this revolutionary 100% online program"*

Machine Learning has a wide variety of practical applications in the dental area, which can improve both patient care and the accuracy of diagnosis and treatment. One of its most outstanding functions consists of Teleodontology, which allows remote consultations and patient follow-up through videoconferencing or even mobile applications. In this way, after dental treatment such as orthodontics or surgery, patients can perform virtual follow-ups so that dentists can evaluate their progress and make adjustments as necessary. In addition, in emergency cases such as severe pain, users can communicate with professionals for immediate guidance.

Aware of this, TECH is implementing a Postgraduate Certificate that will deal in detail with the innovation that Machine Learning in Dentistry has brought about. The syllabus will delve into the application of robotic arms for precision dental surgeries and endodontic procedures. At the same time, the syllabus will analyze various AI tools aimed at optimizing administrative workflows. The didactic materials will highlight the relevance of assessing the satisfaction of individuals through online comments. Professionals will take advantage of patient *feedback* to optimize their procedures and provide care based on excellence.

Thanks to the 100% delivery mode of this Postgraduate Certificate, dentists will achieve effective learning through the management of their own study time. Likewise, they will have access to didactic content through cutting-edge supports such as self-assessment tests or interactive summaries. TECH's goal is to provide you with a learning experience that is available 24 hours a day, enjoyable and completely adapted to your academic and personal requirements. The only requirement is that students have an electronic device with an Internet connection to access the Virtual Campus.

The **Postgraduate Certificate in Practical Applications of Artificial Intelligence in Dentistry** 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 in Artificial Intelligence in Dentistry
- ◆ The graphic, schematic and practical contents with which it is conceived scientific and practical information on those 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 analyze sentiments in patient feedback and provide excellence-based care”*



# 02 Objectives

This program will provide students with advanced skills related to the application of AI in fields such as 3D printing, clinical management or automation of administrative tasks. Along the same lines, graduates will analyze patient *feedback* in order to optimize clinical management and provide more effective dental experiences. On the other hand, professionals will strategically implement Machine Learning in dental education and teaching, so that practitioners are equipped to adapt to technological innovations in this healthcare field.





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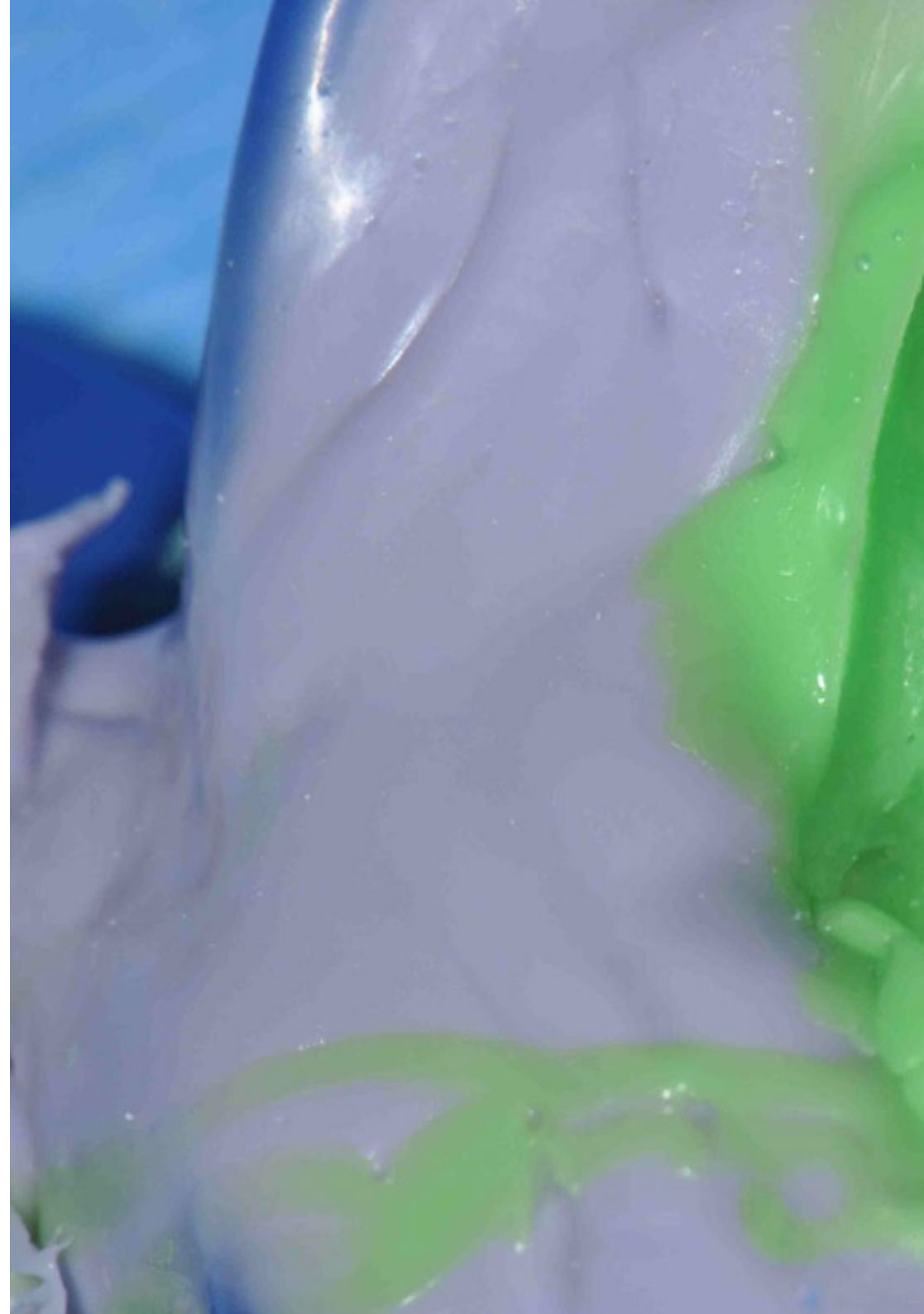
*A first class educational experience  
that will raise your professional  
horizons in only 180 hours”*



## General Objectives

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- ◆ Understand the theoretical foundations of Artificial Intelligence
- ◆ Study the different types of data and understand the data lifecycle
- ◆ Evaluate the crucial role of data in the development and implementation of AI solutions
- ◆ Delve into algorithms and complexity to solve specific problems
- ◆ Explore the theoretical basis of neural networks for *Deep Learning* development
- ◆ Explore bio-inspired computing and its relevance in the development of intelligent systems
- ◆ Analyze current strategies of Artificial Intelligence in various fields, identifying opportunities and challenges
- ◆ Gain a solid understanding of *Machine Learning* principles and their specific application in dental contexts
- ◆ Analyze dental data, including visualization techniques to improve diagnostics
- ◆ Acquire advanced skills in the application of AI for the accurate diagnosis of oral diseases and interpretation of dental images
- ◆ Understand the ethical and privacy considerations associated with the application of AI in dentistry
- ◆ Explore ethical challenges, regulations, professional liability, social impact, access to dental care, sustainability, policy development, innovation, and future prospects in the application of AI in dentistry





## Specific Objectives

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- Develop specialized skills in the application of AI in 3D printing, robotics, dental materials development, clinical management, teledontology, and automation of administrative tasks, addressing diverse areas of dental practice
- Acquire the ability to strategically implement AI in dental education and training, ensuring that practitioners are equipped to adapt to constantly evolving technological innovations in the dental field
- Develop specialized skills in the application of AI in 3D printing, robotics, dental materials development, and automation of administrative tasks
- Employ AI to analyze patient *feedback*, optimizing clinical management in dental clinics to improve patient experience



*TECH's learning system follows the highest international quality standards"*



03

# Course Management

TECH's philosophy is to offer quality education within everyone's reach. In order to maintain this commitment, it always carries out a rigorous selection of the teachers who teach each of its programs. Therefore, the professionals who enter this Postgraduate Certificate will have before them a specialized teaching team with an excellent background in the field of Practical Applications of AI in Dentistry. This guarantees the students to obtain the latest knowledge in this field from an expert teaching staff that will also solve any doubts that may arise about the syllabus during the course of this program.







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*You will have access to a syllabus designed by a reputable teaching staff, which will guarantee you a successful learning"*

## Management



### Dr. Peralta Martín-Palomino, Arturo

- ♦ CEO and CTO at Prometheus Global Solutions
- ♦ CTO at Korporate Technologies
- ♦ CTO at AI Shephers 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
- ♦ Professional Master's Degree in Executive MBA by the Isabel I University
- ♦ Professional Master's Degree in Sales and Marketing Management, Isabel I University
- ♦ Expert Master's Degree in Big Data by Hadoop Training
- ♦ Professional Master's Degree in Advanced Information Technologies from the University of Castilla - La Mancha
- ♦ Member of: SMILE Research Group



### **Dr. Martín-Palomino Sahagún, Patricia**

- ♦ Specialist in Dentistry and Orthodontics
- ♦ Private Orthodontist
- ♦ Researcher
- ♦ Ph.D. in Dentistry from the University Alfonso X El Sabio
- ♦ Postgraduate in Orthodontics from the University Alfonso X El Sabio
- ♦ Degree in Dentistry at the University of Alfonso X El Sabio

## **Professors**

### **Mr. Popescu Radu, Daniel Vasile**

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

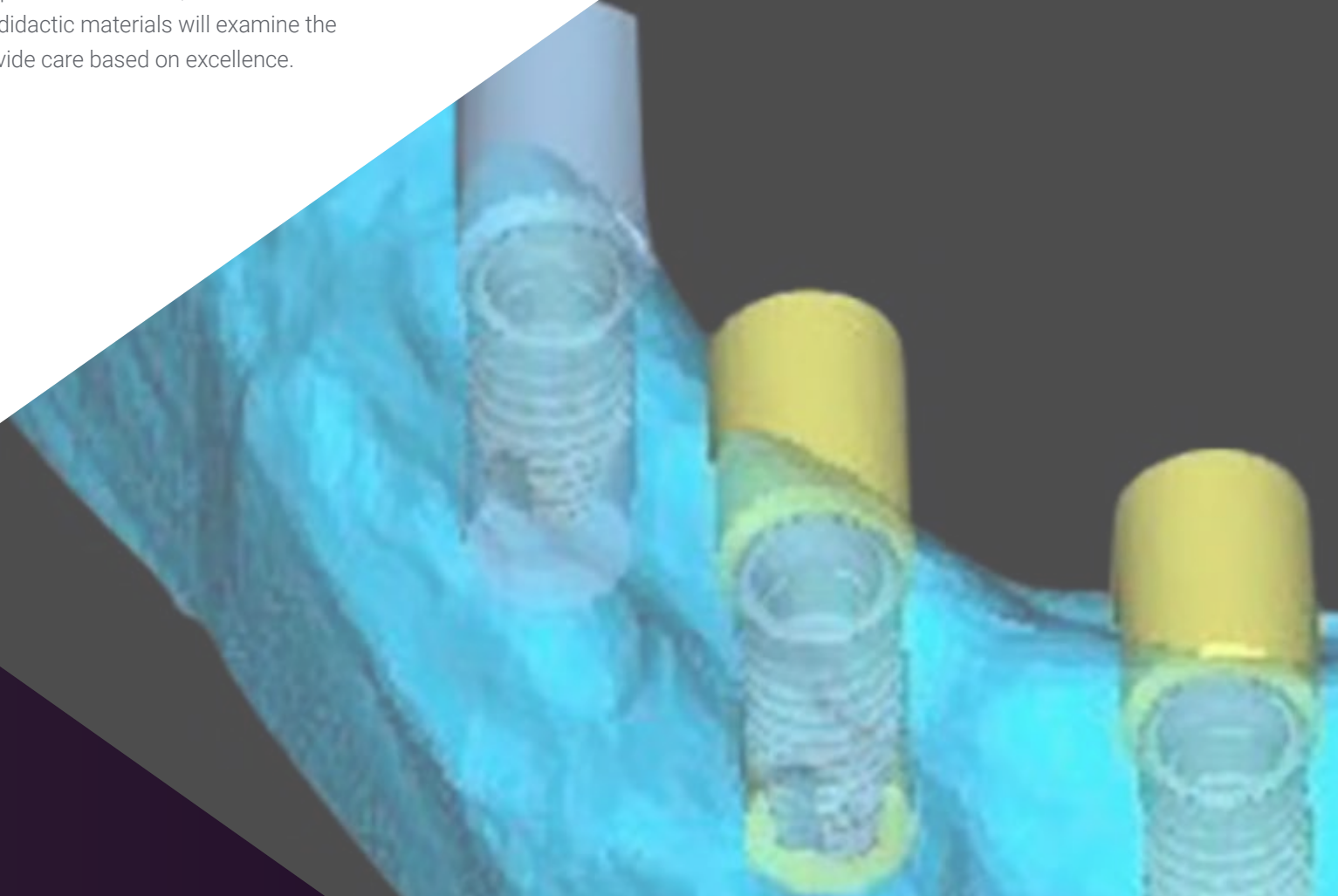
### **Dr. Carrasco González, Ramón Alberto**

- ♦ Specialist in Computer Science and Artificial Intelligence
- ♦ 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
- ♦ Ph.D. in Artificial Intelligence from the University of Granada
- ♦ Computer Engineer from the University of Granada

# 04

## Structure and Content

This Postgraduate Certificate will focus on the implementation of Machine Learning in different aspects of dental practice, in order to promote both innovations and practical applications. To this end, the syllabus will delve into 3D printing, dental manufacturing and assisted robotics in dental processes. The syllabus will delve into new developments in dental materials through the implementation of AI, such as virtual consultations for critically ill patients. In addition, the didactic materials will examine the feelings of users' opinions, so that graduates can provide care based on excellence.







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

## Module 1. Innovation with AI in Dentistry

- 1.1. 3D Printing and Digital Fabrication in Dentistry
  - 1.1.1. Use of 3D Printing for the Creation of Customized Dental Prostheses
  - 1.1.2. Fabrication of Orthodontic Splints and Aligners using 3D Technology
  - 1.1.3. Development of Dental Implants using 3D Printing
  - 1.1.4. Application of Digital Fabrication Techniques in Dental Restoration
- 1.2. Robotics in Dental Procedures
  - 1.2.1. Implementation of Robotic Arms for Precision Dental Surgeries
  - 1.2.2. Use of Robots in Endodontic and Periodontic Procedures
  - 1.2.3. Development of Robotic Systems for Dental Operations Assistance
  - 1.2.4. Integration of Robotics in the Practical Teaching of Dentistry
- 1.3. Development of AI-assisted Dental Materials
  - 1.3.1. Use of AI to Innovate in Dental Restorative Materials
  - 1.3.2. Predictive Analytics for Durability and Efficiency of New Dental Materials
  - 1.3.3. AI in the Optimization of Properties of Materials such as Resins and Ceramics
  - 1.3.4. AI Systems to Customize Materials according to Patient's Needs
- 1.4. AI-enabled Dental Practice Management
  - 1.4.1. AI Systems for Efficient Appointment and Scheduling Management
  - 1.4.2. Data Analysis to Improve Quality of Dental Services
  - 1.4.3. AI Tools for Inventory Management in Dental Clinics with ZenSupplies
  - 1.4.4. Use of AI in the Evaluation and Continuous Improvement of Dental Practice
- 1.5. Teleodontology and Virtual Consultations
  - 1.5.1. Tele-dentistry Platforms for Remote Consultations
  - 1.5.2. Use of Videoconferencing Technologies for Remote Diagnosis
  - 1.5.3. AI Systems for Online Preliminary Assessment of Dental Conditions
  - 1.5.4. Tools for Secure Communication between Patients and Dentists
- 1.6. Automation of Administrative Tasks in Dental Clinics
  - 1.6.1. Implementation of AI Systems for Billing and Accounting Automation
  - 1.6.2. Use of AI Software in Patient Record Management
  - 1.6.3. AI Tools for Optimization of Administrative Workflows
  - 1.6.4. Automatic Scheduling and Reminder Systems for Dental Appointments





- 1.7. Sentiment Analysis of Patient Opinions
  - 1.7.1. Using AI to Assess Patient Satisfaction through Online Feedback with Qualtrics
  - 1.7.2. Natural Language Processing Tools for Analyzing Patient *Feedback*
  - 1.7.3. AI Systems to Identify Areas for Improvement in Dental Services
  - 1.7.4. Analysis of Patient Trends and Perceptions using AI
- 1.8. AI in Marketing and Patient Relationship Management
  - 1.8.1. Implementation of AI Systems to Personalize Dental Marketing Strategies
  - 1.8.2. AI Tools for Customer Behavior Analysis with Qualtrics
  - 1.8.3. Use of AI in the Management of Marketing Campaigns and Promotions
  - 1.8.4. AI-based Patient Recommendation and Loyalty Systems
- 1.9. Safety and Maintenance of AI Dental Equipment
  - 1.9.1. AI Systems for Monitoring and Predictive Maintenance of Dental Equipment
  - 1.9.2. Use of AI in Ensuring Compliance with Safety Regulations
  - 1.9.3. Automated Diagnostic Tools for Equipment Failure Detection
  - 1.9.4. Implementation of AI-assisted Safety Protocols in Dental Practices
- 1.10. Integration of AI in Dental Education and Training with Dental Care App
  - 1.10.1. Use of AI in Simulators for Hands-on Training in Dentistry
  - 1.10.2. AI Tools for the Personalization of Learning in Dentistry
  - 1.10.3. Systems for Evaluation and Monitoring of Educational Progress using AI
  - 1.10.4. Integration of AI Technologies in the Development of Curricula and Didactic Materials

“*This university program will allow you to meet your professional aspirations in just 6 weeks. Enroll now!*”

# 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"*

## At TECH we use the Case Method

In a given situation, what should a professional do? Throughout the program, students will face multiple simulated clinical cases, based on real patients, in which they will have to do research, establish hypotheses, and ultimately resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

*With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world.*



According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, trying to recreate the real conditions in the dentist's professional practice.

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*Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method”*

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

1. Dentists who follow this method not only grasp concepts, but also develop their mental capacity by means of exercises to evaluate real situations and apply their 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.



## Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

*The student will learn through real cases and by solving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.*





At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology we have trained more than 115,000 dentists with unprecedented success, in all specialties regardless of the workload. Our pedagogical methodology is developed in a highly competitive environment, with a university student body with a strong socioeconomic profile and an average age of 43.5 years old.

*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.*

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.

The overall score obtained by TECH's learning system is 8.01, according to the highest international standards.



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.



#### Educational Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances, and to the forefront of medical techniques. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch the videos as many times as you like.



#### Interactive Summaries

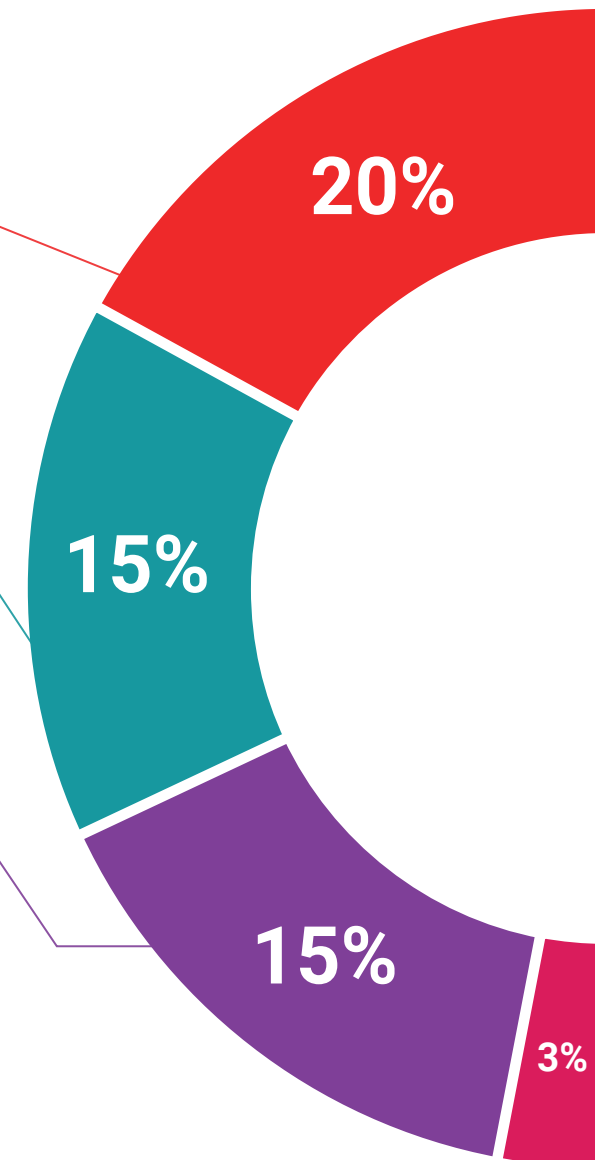
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

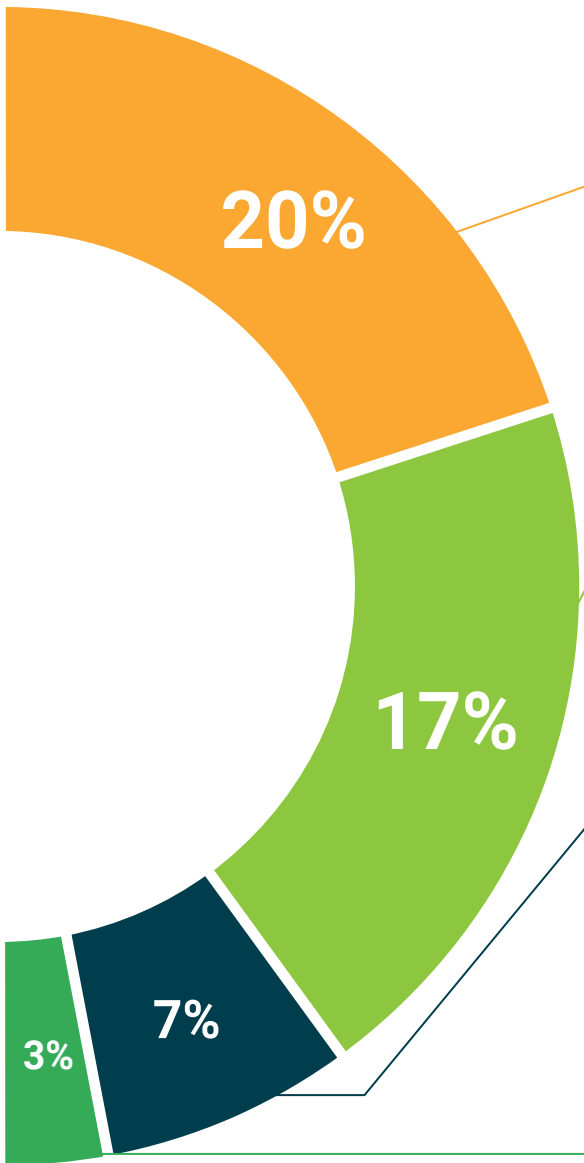
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



#### 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.





**Expert-Led Case Studies and Case Analysis**

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.



**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.



**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.



**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.



06

# Certificate

The Postgraduate Certificate in Practical Applications of Artificial Intelligence in Dentistry 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 Practical Applications of Artificial Intelligence in Dentistry** 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 Practical Applications of Artificial Intelligence in Dentistry**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



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

future  
health confidence people  
education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present  
development languages  
virtual classroom



## Postgraduate Certificate Practical Applications of Artificial Intelligence in Dentistry

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