

Postgraduate Certificate

Advanced Analysis and Data Processing in Dentistry



Postgraduate Certificate

Advanced Analysis and Data Processing in Dentistry

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

Website: www.techitute.com/in/dentistry/postgraduate-certificate/advanced-analysis-data-processing-dentistry

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01

Introduction

The use of Big Data in Dentistry has the potential to transform the way oral health care is delivered. The storage and analysis of large data sets enables efficient management of patient records. This includes information regarding medical records, radiographic images, treatment records and appointment scheduling. In tune with this, algorithms serve to predict the likelihood of individuals developing certain dental diseases. This leads to earlier intervention and preventive care. Given this, TECH is developing a university program that will address the applications of data in dentistry. In addition, it will be taught in a convenient 100% online mode.





*Study from the comfort of your home
and update your knowledge online with
TECH Technological University, the
biggest online university in the world"*

Advanced Analysis and Data Processing in Dentistry involves the application of sophisticated technologies to extract valuable information from oral health data. Among the key areas where this is used is in treatment monitoring. This procedure allows continuous monitoring of patients undergoing therapy to assess efficiency and make adjustments as needed. In addition, in cases of hereditary dental conditions, genomic analysis can be carried out to better understand the genetic predisposition and risk of oral diseases.

In this context, TECH implements a Postgraduate Certificate that will address in detail the Advanced Analysis and Data Processing in Dentistry. The syllabus will delve into Deep Learning for oral health analysis. Likewise, the syllabus will analyze the integration of clinical data for effective management with AI tools. In this sense, the didactic materials will emphasize the importance of analyzing both opinions and feelings in social media. In this way, experts will be able to identify social media trends in oral health communities.

It should be noted that students will be able to combine their daily responsibilities with an education that gives them flexibility and self-management of their study time. And the fact is that, without the need to go to a center in person, or have classes with fixed schedules, students can access the syllabus of this program at any time of day and from any electronic device with an Internet connection. In addition, the university program is based on the revolutionary Relearningmethod, of which TECH is a pioneer. This consists of the repetition of key contents to ensure a progressive and natural learning process, without the need to make extra efforts such as memorizing.

This **Postgraduate Certificate in Advanced Analysis and Data Processing 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 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 perform the most reliable predictive analysis to prevent oral conditions such as caries"



Looking to specialize in detecting anomalies in dental records? Achieve it in just 6 weeks with this revolutionary program"

The program's teaching staff includes professionals from the sector who contribute their work experience to this 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.

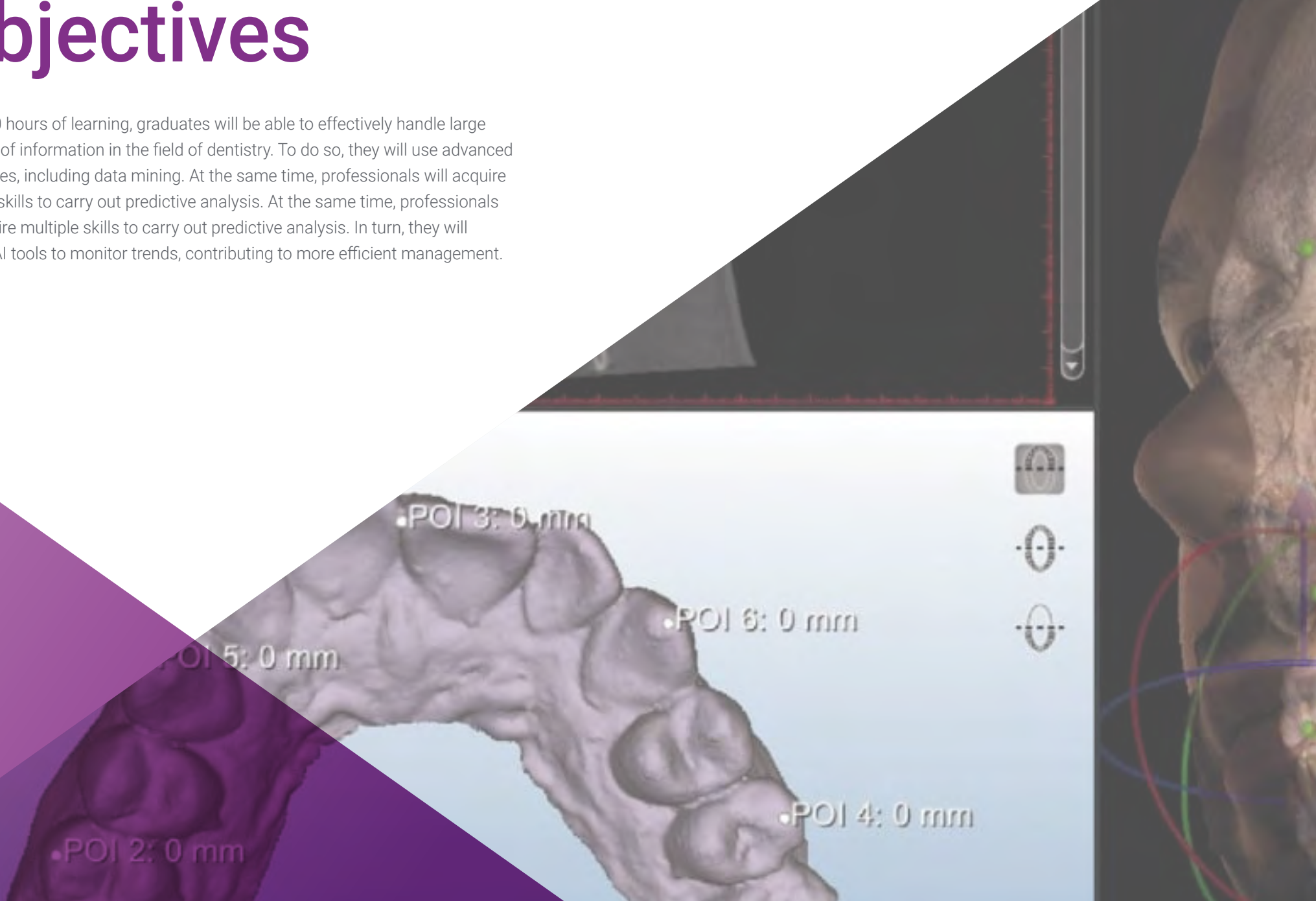
You will implement the most advanced techniques of Predictive Analytics in Oral Health.

Relearning will allow you to learn with less effort and more performance, getting more involved in your professional specialization.



02 Objectives

After 150 hours of learning, graduates will be able to effectively handle large volumes of information in the field of dentistry. To do so, they will use advanced procedures, including data mining. At the same time, professionals will acquire multiple skills to carry out predictive analysis. At the same time, professionals will acquire multiple skills to carry out predictive analysis. In turn, they will employ AI tools to monitor trends, contributing to more efficient management.



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*Increase your confidence in
decision-making by updating
your knowledge through this
Postgraduate Certificate"*



General Objectives

- 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

- ♦ Handle large datasets in dentistry, understanding the concepts and applications of Big Data, as well as the implementation of data mining and predictive analytics techniques
- ♦ Develop advanced skills in the management of large datasets in dentistry, understanding the concepts and applications of Big Data, as well as the implementation of data mining and predictive analytics techniques
- ♦ Employ AI tools for monitoring oral health trends and patterns, contributing to more efficient management
- ♦ Explore and discuss the various ways in which data analytics is used to improve clinical decision making, patient care management and research in Dentistry

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With the highest rated learning assistance methods in online teaching, this program will allow you to learn smoothly, consistently and effectively"

03

Course Management

One of the differentiating components of this university program is its faculty. An excellent team of professionals with extensive experience in the field of Advanced Analysis and Data Processing in Dentistry. In this way, TECH offers students the guarantee of access to a syllabus prepared by real experts in this field with extensive experience in the sector. In addition, thanks to its proximity, the graduates will be able to resolve any doubts they may have about the content throughout this academic itinerary.





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*The diverse talents and expertise
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 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 advanced technologies in data management in the dental field. The syllabus will analyze the impact that Big Data has had in this field, examining cutting-edge tools such as Data Mining to extract valuable data. The syllabus will also delve into advanced predictive analytics techniques in Oral Health, which will enable the student to efficiently manage clinical information. Moreover, the module will explore how to leverage social media and AI to monitor both the latest trends and patterns in Oral Health.



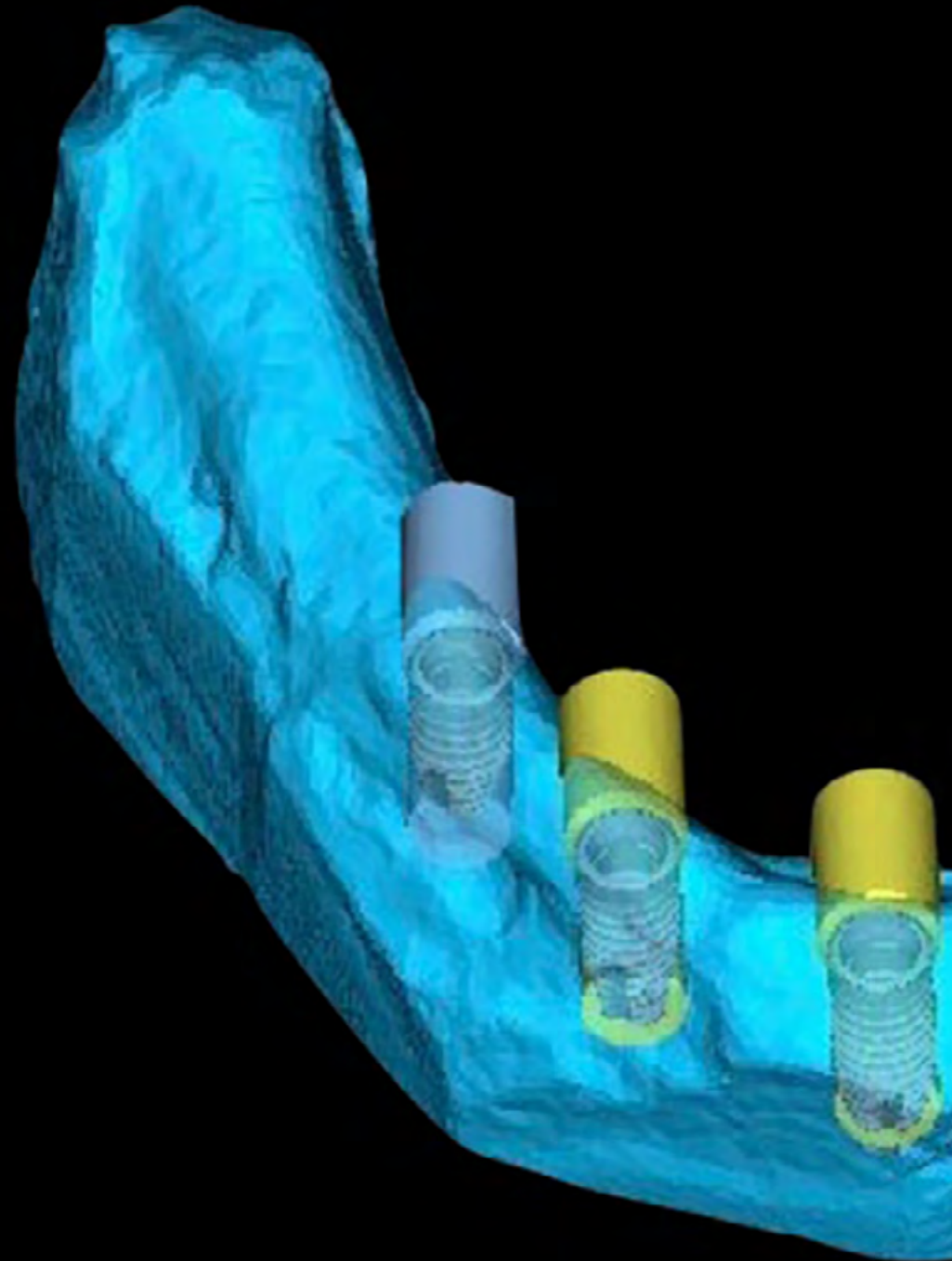


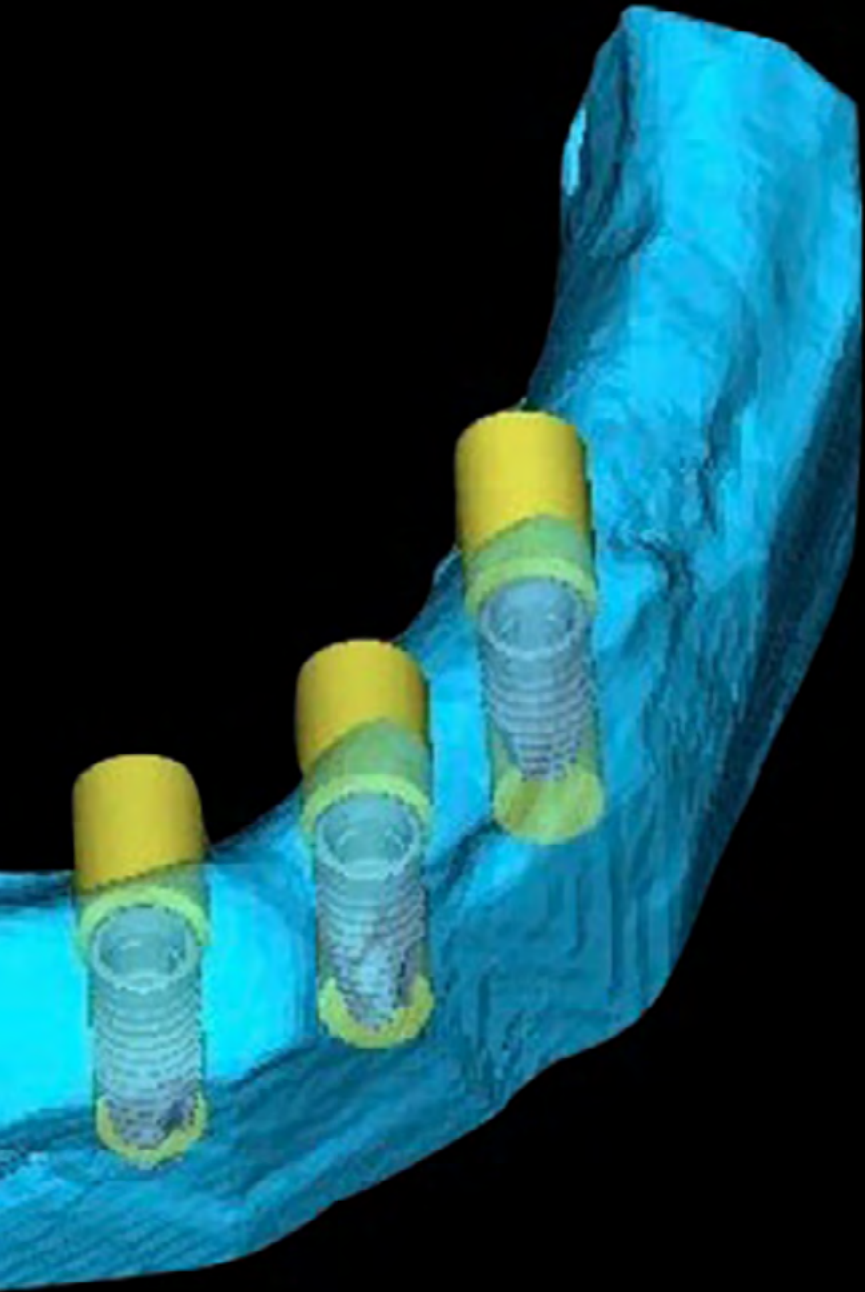
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You will achieve a more efficient management thanks to innovative tools dedicated to monitoring trends and patterns in Oral Health"

Module 1. Advanced Analytics and Data Processing in Dentistry

- 1.1. Big Data in Dentistry: Concepts and Applications
 - 1.1.1. The Explosion of Data in Dentistry
 - 1.1.2. Concept of Big Data
 - 1.1.3. Applications of Big Data in Dentistry
- 1.2. Data Mining in Dental Records with KNIME and Python
 - 1.2.1. Main Methodologies for Data Mining
 - 1.2.2. Integration of Data from Dental Records
 - 1.2.3. Detection of Patterns and Anomalies in Dental Records
- 1.3. Advanced Predictive Analytics in Oral Health with KNIME and Python
 - 1.3.1. Classification Techniques for Oral Health Analysis
 - 1.3.2. Regression Techniques for Oral Health Analytics
 - 1.3.3. Deep Learning for Oral Health Analysis
- 1.4. AI Models for Dental Epidemiology with KNIME and Python
 - 1.4.1. Classification Techniques for Dental Epidemiology
 - 1.4.2. Regression Techniques for Dental Epidemiology
 - 1.4.3. Unsupervised Techniques for Dental Epidemiology
- 1.5. AI in Clinical and Radiographic Data Management with KNIME and Python
 - 1.5.1. Integration of Clinical Data for Effective Management with AI Tools
 - 1.5.2. Transformation of Radiographic Diagnosis using Advanced AI Systems
 - 1.5.3. Integrated Management of Clinical and Radiographic Data
- 1.6. Machine Learning Algorithms in Dental Research with KNIME and Python
 - 1.6.1. Classification Techniques in Dental Research
 - 1.6.2. Regression Techniques in Dental Research
 - 1.6.3. Unsupervised Techniques in Dental Research
- 1.7. Social Media Analysis in Oral Health Communities with KNIME and Python
 - 1.7.1. Introduction to Social Network Analysis
 - 1.7.2. Analysis of Opinions and Sentiment in Social Networks in Oral Health Communities
 - 1.7.3. Analysis of Social Network Trends in Oral Health Communities





- 1.8. AI in Monitoring Oral Health Trends and Patterns with KNIME and Python
 - 1.8.1. Early Detection of Epidemiologic Trends with AI
 - 1.8.2. Continuous Monitoring of Oral Hygiene Patterns with AI Systems
 - 1.8.3. Prediction of Changes in Oral Health with AI Models
- 1.9. AI Tools for Cost Analysis in Dentistry with KNIME and Python
 - 1.9.1. Optimization of Resources and Costs with AI Tools
 - 1.9.2. Efficiency and Cost-Effectiveness Analysis in Dental Practices with AI
 - 1.9.3. Cost Reduction Strategies Based on AI-analyzed Data
- 1.10. Innovations in AI for Dental Clinical Research
 - 1.10.1. Implementation of Emerging Technologies in Dental Clinical Research
 - 1.10.2. Improving the Validation of Dental Clinical Research Results with AI
 - 1.10.3. Multidisciplinary Collaboration in AI-powered Dental Clinical Research



You will have access to the contents from any fixed or portable device with Internet connection, even from your cell phone"

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.



A close-up photograph of a medical device, likely an ultrasound machine. The device is white and blue, with two probes resting on a blue surface. A control panel with several buttons is visible. The image is partially obscured by a large purple diagonal overlay on the right side.

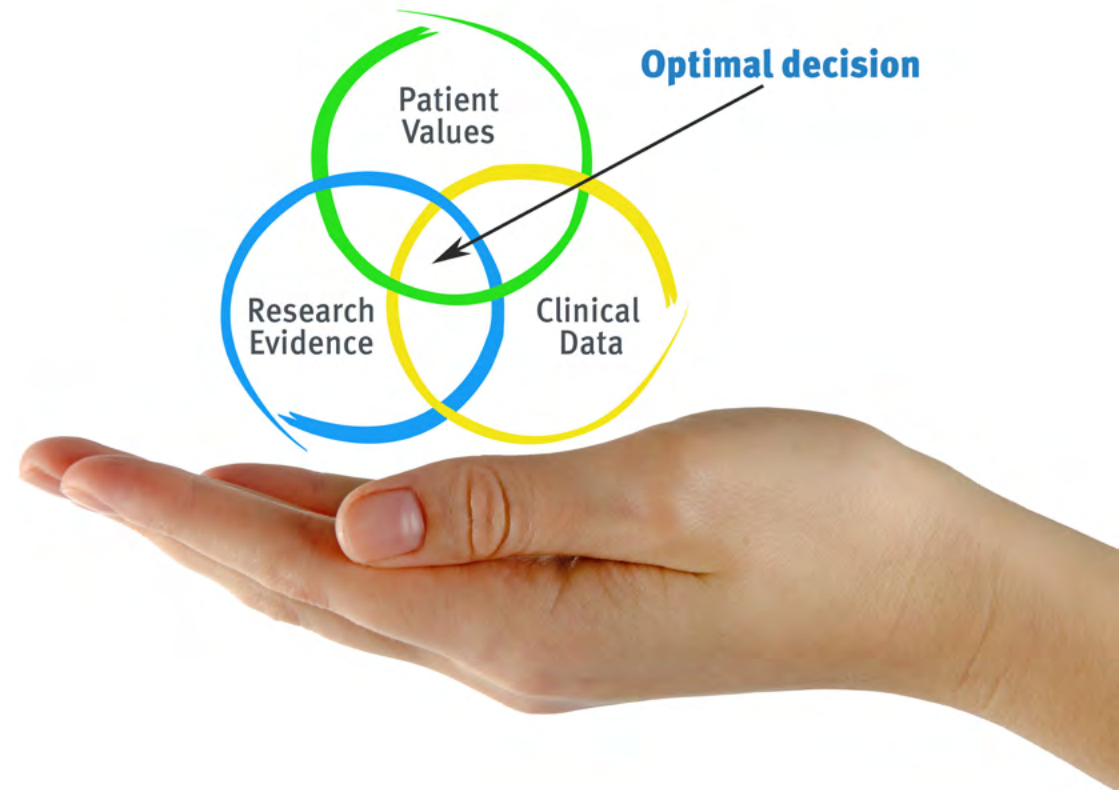
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Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

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. Gervas, 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.

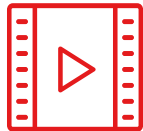
*Relearning will allow you to learn with less effort
and better performance, involving you more
in your training, developing a critical mindset,
defending arguments, and contrasting opinions: a
direct equation for success.*

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

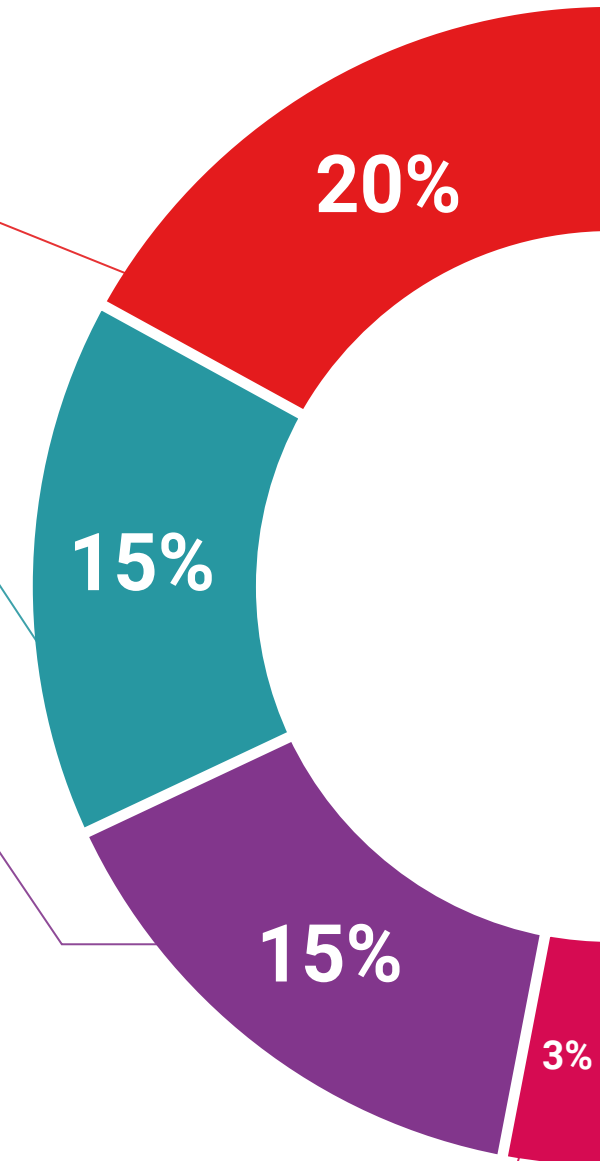
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

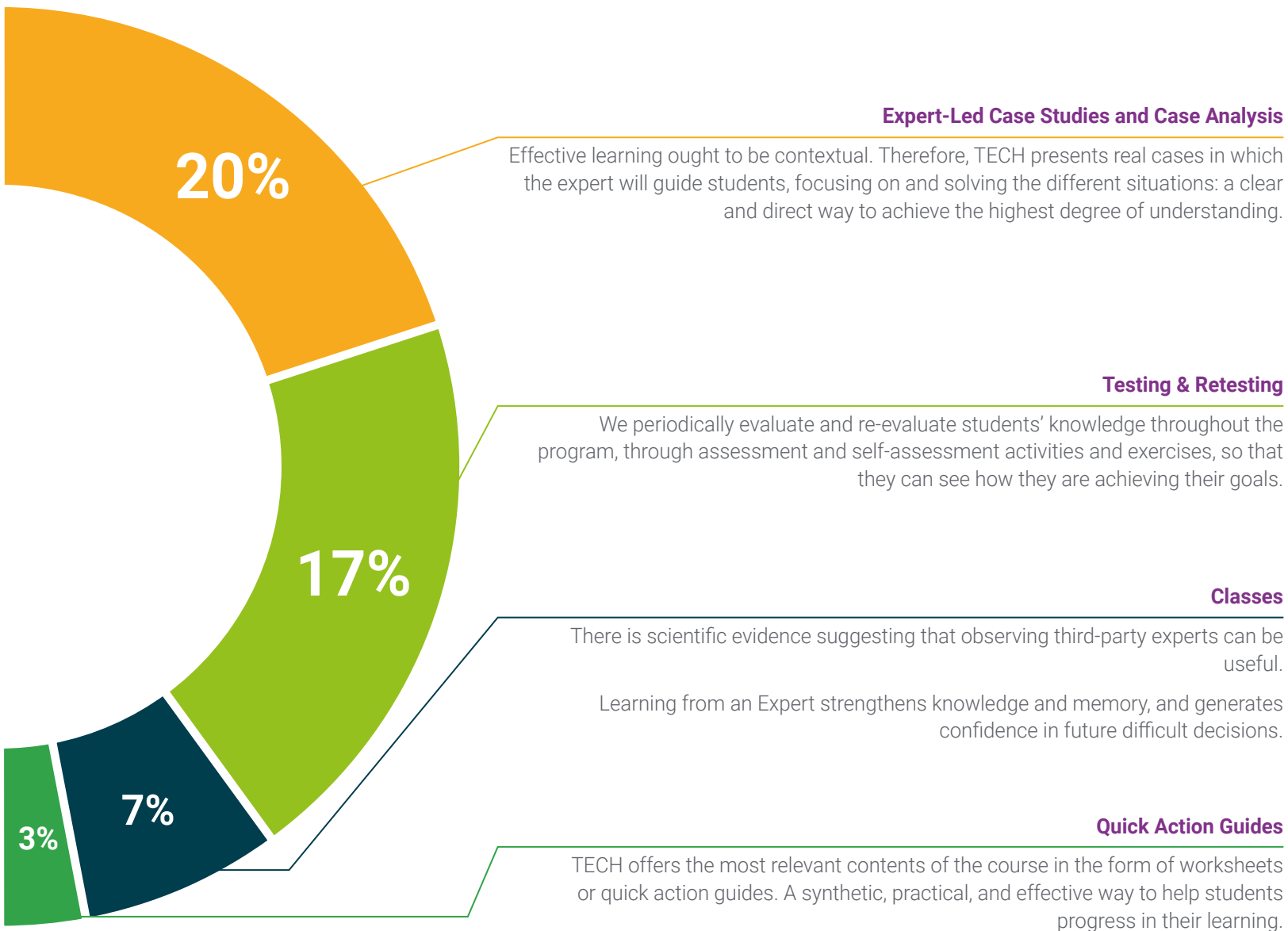
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



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.





06 Certificate

The Postgraduate Certificate in Advanced Analysis and Data Processing in Dentistry guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.



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

This **Postgraduate Certificate in Advanced Analysis and Data Processing in Dentistry** contains the most complete and up-to-date scientific on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Certificate** issued by **TECH Technological University** via tracked delivery*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Certificate, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Certificate in Advanced Analysis and Data Processing in Dentistry**

Official N° of Hours: **150 h.**



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



Postgraduate Certificate Advanced Analysis and Data Processing in Dentistry

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Postgraduate Certificate

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