Postgraduate Certificate
Diagnosis and Treatment Strategies with Artificial Intelligence in Dentistry

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Postgraduate Certificate
Diagnosis and Treatment Strategies with Artificial Intelligence in Dentistry

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

Website: **www.techtitute.com/pk/dentistry/postgraduate-certificate/diagnosis-treatment-strategies-artificial-intelligence-dentistry**

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01
Introduction

The use of Machine Learning algorithms is very useful for identifying oral diseases ranging from Caries to Leukoplakia. For example, they are able to analyze dental images (such as X-rays or intraoral photographs) to identify early signs of oral disease. In this way, practitioners optimize efficiency in the dental clinic by reducing the time required to arrive at both a diagnosis and treatment plan. Therefore, experts provide more accurate and personalized care to their patients to significantly improve their quality of life. For this reason, TECH is developing a university program that will analyze the use of AI tools to detect oral diseases. And all under a convenient 100% online format.

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

Diagnosis and Treatment Strategies with Artificial Intelligence in Dentistry (AI) represents an innovative application that has the potential to significantly improve dental care. These systems serve to assess gingival health by analyzing gum appearance and pocket depth measurements. This aids in the detection of conditions such as periodontitis. In addition, the algorithms help dentists to create highly personalized treatment plans based on the specific needs of each user, taking into account factors such as current oral health and medical history.

Faced with this reality, TECH implements a Postgraduate Certificate that will address in depth the integration of Machine Learning in diagnostic equipment for real-time analysis. The syllabus will provide the most innovative computer vision technologies in the identification of periodontal diseases (among which 3D Modeling stands out). Likewise, the syllabus will delve into the prediction of risks in oral and dental treatments, developing predictive models to anticipate reactions to therapies. In addition, the didactic materials will highlight the importance of performing monitoring techniques to assess the medical status of patients and to follow up on oral hygiene.

Undoubtedly, the program is an excellent opportunity for updating through a flexible university program that allows professionals to access the syllabus at any time of the day and from a digital device (cell phone, *Tablet* or computer) with an Internet connection. Therefore, without the need to go to an on-site center, or to have classes with scheduled times, dentists have greater freedom to self-manage their study time and take a high quality Postgraduate Certificate. On the other hand, the training is based on the revolutionary *Relearning*methodology, which consists of the repetition of key contents so that the experts have a natural and progressive learning process.

This **Postgraduate Certificate in Diagnosis and Treatment Strategies with 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

Develop predictive models and anticipate your patients' reactions to treatments"

You will use Artificial Intelligence effectively to detect early dental pathologies such as caries.

" *You will master Wearable technology with sensors to identify changes in oral health"*

You will enjoy a library full of multimedia resources in different audiovisual formats, among which interactive summaries stand out.
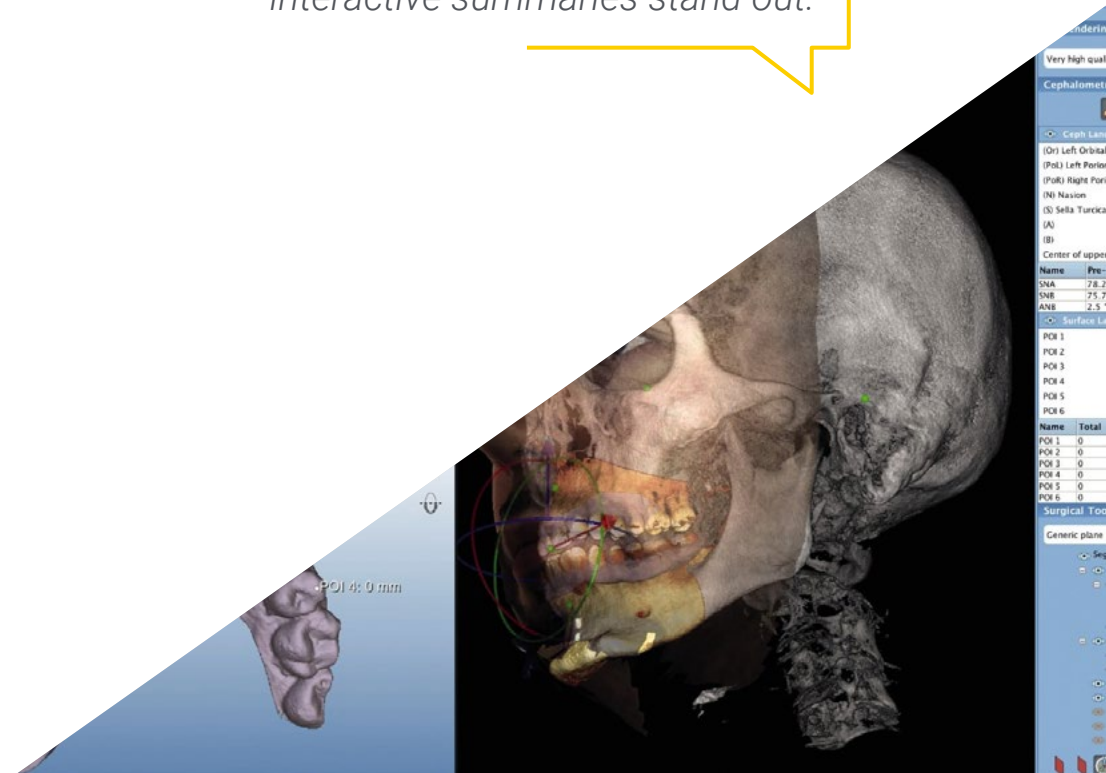
The program's teaching staff includes professionals from the sector who contribute their work experience to this program, as well as renowned specialists from leading societies and prestigious universities.

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.

02
Objectives

This Postgraduate Certificate will raise the professional horizons of the graduates, as they will become true experts in Intelligent Automation applied to dental contexts. In this way, professionals will optimize orthodontic therapeutic processes and offer people personalized plans according to their individual needs. Students will also be highly qualified to make accurate diagnoses of oral diseases, thanks to the correct interpretation of dental images. In this way, they will include in their daily procedures the latest technological trends in the healthcare field, such as dental robotics or 3D modeling.

A process of professional and personal growth that will allow you to acquire the skills of an expert and compete among the best in the sector"

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
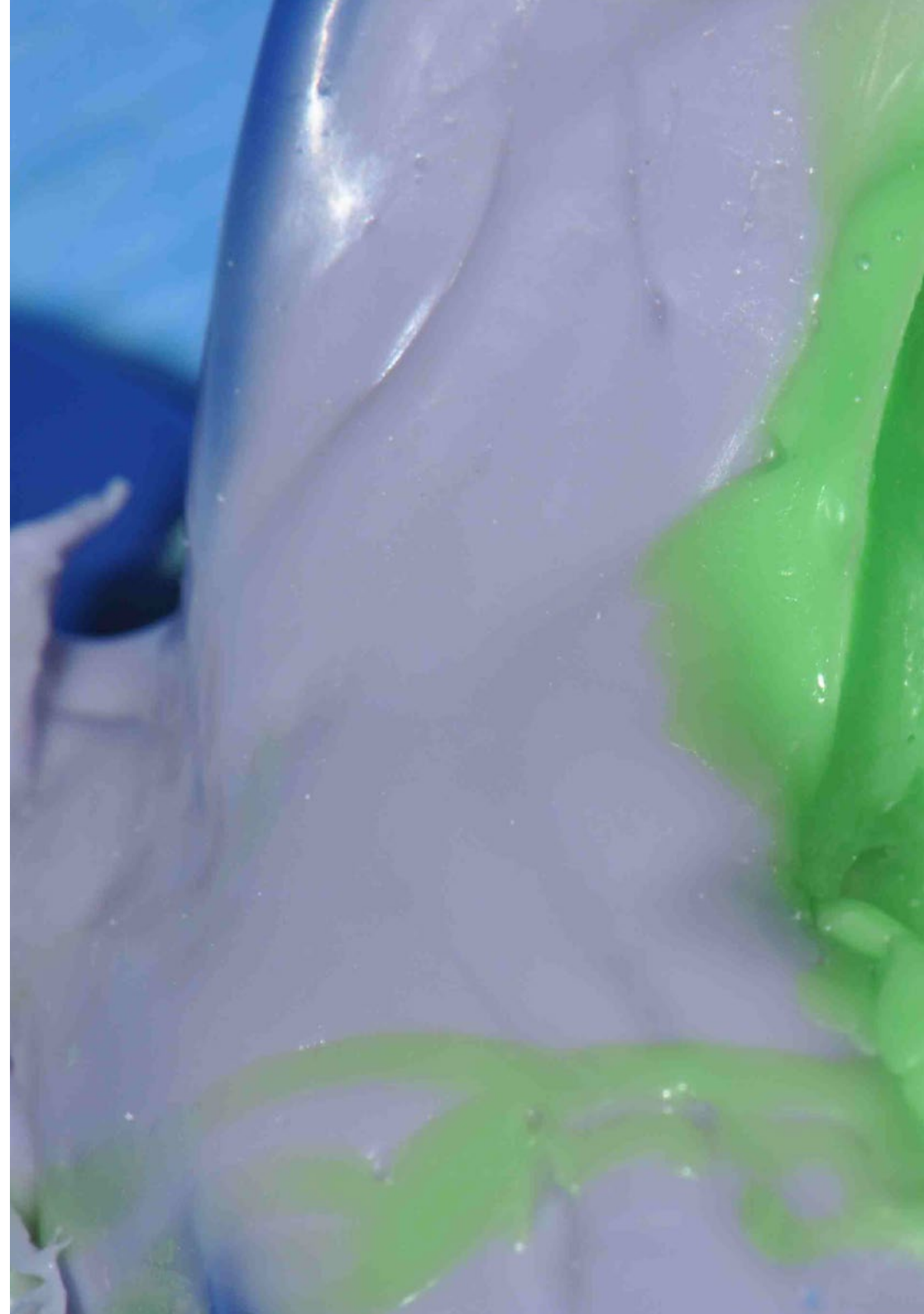
Specific Objectives

- Acquire expertise in the use of AI for treatment planning, including 3D modeling, orthodontic treatment optimization and treatment plan customization
- Develop advanced skills in the application of AI for the accurate diagnosis of oral diseases, including interpretation of dental images and pathology detection
- Obtain competencies to use AI tools in oral health monitoring and oral disease prevention, effectively integrating these technologies into dental practice
- Collect, manage and use both clinical and radiographic data in AI treatment planning

TECH provides you with a high-quality and flexible Postgraduate Certificate. View it conveniently from your computer, mobile or tablet!"

03
Course Management

Students who take this Postgraduate Certificate will have at their disposal the best teaching staff. In choosing them, TECH has taken into account their excellent professional career as academics in the field of Diagnosis and Dental Treatment Strategies with Machine Learning. In this way, the graduates will have the guarantee of accessing a first level qualification with the most advanced syllabus, prepared by the best experts. In this way, they will be able to take advantage of the opportunities offered by a dental industry that is advancing by leaps and bounds.

"

A well-versed teaching staff will guide you throughout the learning process and resolve any doubts that may arise"

Management

Dr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometeus 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

Structure and Content

This program will enrich the clinical practice of professionals by applying AI tools for the diagnosis of oral pathologies. The academic itinerary will focus on the analysis of dental images, with the aim of appreciating details that might go unnoticed by the human eye. Likewise, the syllabus will delve into the benefits of 3D modeling to plan personalized therapies according to the personal circumstances of each user. In addition, the didactic materials will provide multiple guidelines to predict risks such as drug dosing errors. In addition, the didactic materials will provide multiple guidelines to predict risks such as drug dosing errors.
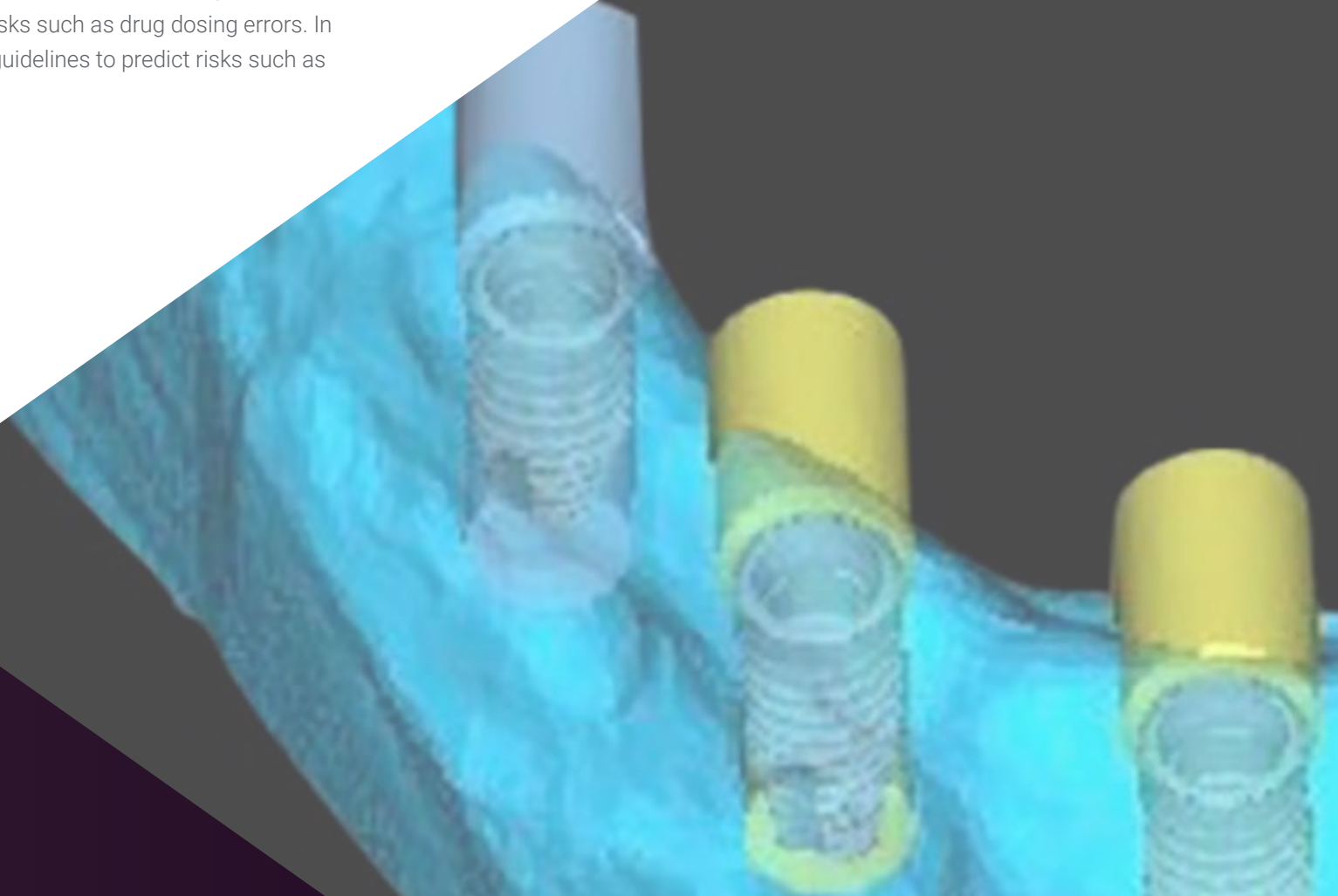
You will acquire advanced skills that will enable you to make the most accurate diagnoses using Machine Learning"

Module 1. AI-assisted Dental Diagnostics and Treatment Planning

1.1. AI in Oral Disease Diagnosis with Pearl

    1.1.1. Use of Machine Learning Algorithms to Identify Oral Diseases

    1.1.2. Integration of AI in Diagnostic Equipment for Real-Time Analysis

    1.1.3. AI-assisted Diagnostic Systems to Improve Accuracy

    1.1.4. Analysis of Symptoms and Clinical Signals through AI for Rapid Diagnostics

1.2. AI Dental Image Analysis with Aidoc and overjet.ai

    1.2.1. Development of Software for the Automatic Interpretation of Dental Radiographs

    1.2.2. AI in the Detection of Abnormalities in Oral MRI Images

    1.2.3. Improvement in the Quality of Dental Imaging through AI Technologies

    1.2.4. Deep Learning Algorithms for Classifying Dental Conditions in Imaging

1.3. AI in Caries and Dental Pathology Detection

    1.3.1. Pattern Recognition Systems for Identifying Early Cavities

    1.3.2. AI for Dental Pathology Risk Assessment with Overjet.ai

    1.3.3. Computer Vision Technologies in the Detection of Periodontal Diseases

    1.3.4. AI Tools for Caries Monitoring and Progression

1.4. 3D Modeling and AI Treatment Planning with Materialise Mimics

    1.4.1. Using AI to Create Accurate 3D Models of the Oral Cavity

    1.4.2. AI Systems in the Planning of Complex Dental Surgeries

    1.4.3. Simulation Tools for Predicting Treatment Outcomes

    1.4.4. AI in the Customization of Prosthetics and Dental Appliances

1.5. Optimization of Orthodontic Treatments using AI

    1.5.1. AI in Orthodontic Treatment Planning and Follow-Up with Dental Monitoring

    1.5.2. Algorithms for the Prediction of Tooth Movements and Orthodontic Adjustments

    1.5.3. AI Analysis to Reduce Orthodontic Treatment Time

    1.5.4. Real-time Remote Monitoring and Treatment Adjustment Systems

1.6. Risk Prediction in Dental Treatments

    1.6.1. AI Tools for Risk Assessment in Dental Procedures

    1.6.2. Decision Support Systems for Identifying Potential Complications

    1.6.3. Predictive Models for Anticipating Treatment Reactions

    1.6.4. AI-enabled Medical Record Analysis to Personalize Treatments using ChatGPT and Amazon Comprehend Medical

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.

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.

"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.

01 learning from evidence

02 relearning from evidence

03 testing

04 learning from an expert

05 neurocognitive context dependent learning

06 Von-Restorff effect

07 case based learning through storytelling

08 competencies testing (retesting)

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.

20%

15%

15%

3%

20%

17%

7%

3%

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 Diagnosis and Treatment Strategies with 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 Technological University.

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

This **Postgraduate Certificate in Diagnosis and Treatment Strategies with Artificial Intelligence in Dentistry** contains the most complete and up-to-date scientific program 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 Diagnosis and Treatment Strategies with Artificial Intelligence in Dentistry**

Official Nº of Hours: **150 h.**

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Awards the following
CERTIFICATE
to
Mr./Ms. _____, with identification number _____.
For having passed and accredited the following program

POSTGRADUATE CERTIFICATE
in
Diagnosis and Treatment Strategies with Artificial Intelligence in Dentistry

This is a qualification awarded by this University, equivalent to 150 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro
Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country.

Unique TECH Code: AFWORD23S   techtitute.com/certificates

*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.

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