Postgraduate Certificate
Fields and Waves

tech technological university

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Postgraduate Certificate

Fields and Waves

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

Website: www.techtitute.com/in/information-technology/postgraduate-certificate/fields-waves

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01

Introduction

The objective of this program is to provide telecommunications professionals with in-depth knowledge of everything related to fields and waves, which are fundamental for the transmission of messages. Therefore, this program brings students closer to this field, with an up-to-date and high-quality program. It is a comprehensive preparation course that seeks to prepare students for success in their profession.

If you are looking for a quality Postgraduate Certificate that will help you start working in in one of the most promising professional fields, this is your best option"

Advances in telecommunications are happening all the time, as this is one of the fastest evolving areas. It is therefore necessary to have IT experts who can adapt to these changes and have first-hand knowledge of the new tools and techniques that are emerging in this field.

This Postgraduate Certificate in Fields and Waves addresses the complete range of topics involved in this field. Its study has a clear advantage over other programs that focus on specific blocks, which prevents students from knowing the interrelation with other areas included in the multidisciplinary field of telecommunications. In addition, the teaching team of this educational program has made a careful selection of each of the topics of this to offer students the most comprehensive study opportunity possible and always linked to current events.

Specifically, this educational program focuses on mathematics for field physics, waves, electromagnetic fields and Maxwell's equations, uniform plane waves, transmission lines and antennas, among other issues.

This Postgraduate Certificate is aimed at those interested in attaining a higher level of knowledge of Fields and Waves. The main objective is for students to specialize their knowledge in simulated work environments and conditions in a rigorous and realistic manner so they can later apply it in the real world.

Additionally, as it is a 100% online program, the student is not constrained by fixed timetables or the need to move to another physical location, but can access the contents at any time of the day, balancing their professional or personal life with their academic life.

This **Postgraduate Certificate in Fields and Waves** contains the most complete and up-to-date program on the market. The most important features include:

- The development of practical case studies presented by experts in Fields and Waves
- 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
- Special emphasis on innovative methodologies in Fields and Waves
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection

Do not miss the opportunity to take this Postgraduate Certificate in Fields and Waves with us. It's the perfect opportunity to advance your career"

This Postgraduate Certificate is the best investment you can make when selecting a refresher program to update your knowledge in Fields and Waves"

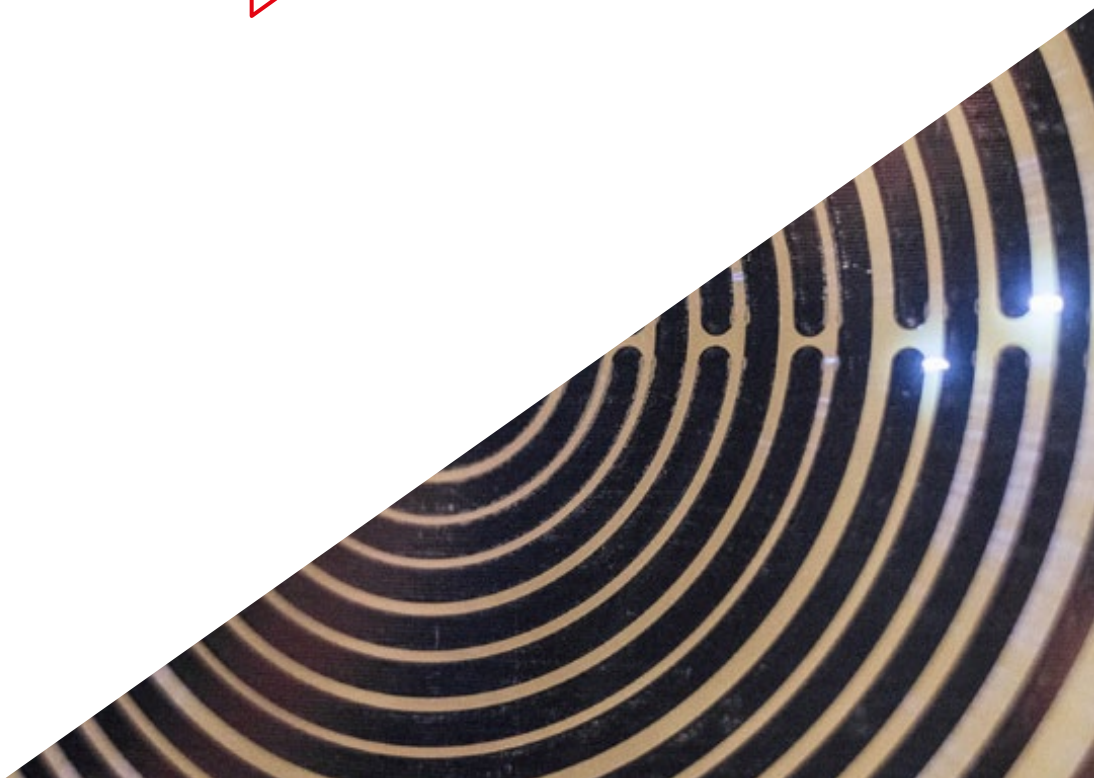
This program comes with the best educational material, providing you with a contextual approach that will facilitate your learning.

This 100% online Postgraduate Certificate will allow you to combine your studies with your professional work.

The teaching staff includes professionals from the field of information technology, who bring their experience to this specialization 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. To do so, professionals will be assisted by an innovative interactive video system created by renowned Fields and Waves experts.



02

Objectives

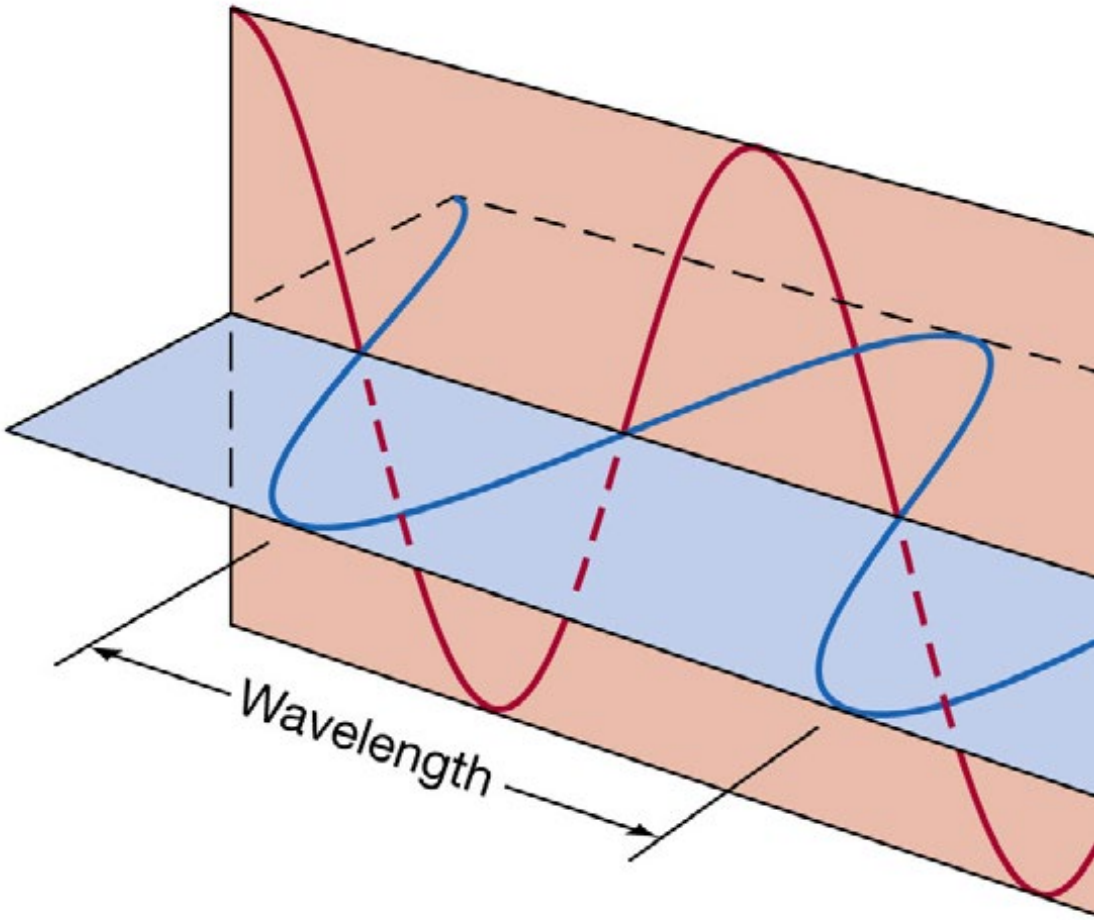
This Postgraduate Certificate in Fields and Waves is designed to facilitate professional performance in the field to acquire knowledge of the main developments in the sector.

Our goal is to make you the best professional in your sector. And for this we have the best methodology and content"

General Objective

- Prepare students to be able to develop their work with total confidence and quality in the field of Fields and Waves

Study at the one of the world's leading private online universities"



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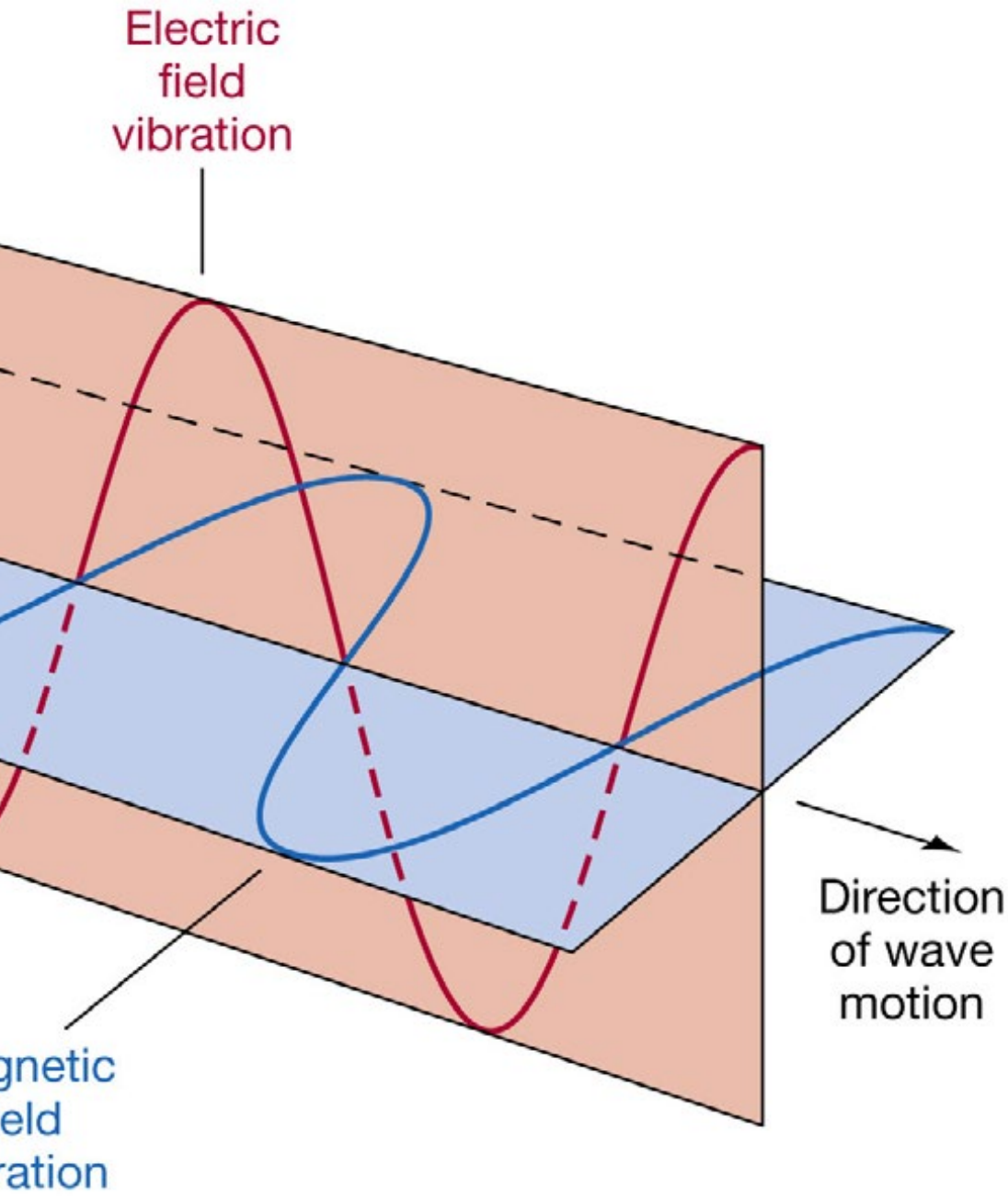


Specific Objectives

- Know how to qualitatively and quantitatively analyze the basic mechanisms of electromagnetic wave propagation phenomena and their interaction with obstacles, both in free space and in guidance systems
- Understand the fundamental parameters of the transmission media of a communications system
- Understand the concept of waveguide and the electromagnetic model of transmission lines, as well as the most important types of waveguides and lines
- Solve transmission line problems using the Smith chart
- Apply impedance matching techniques properly
- Know the basics of antenna operation

03

Structure and Content

The structure of the contents has been designed by the best professionals in the from the engineering sector, with extensive experience and recognized prestige in the profession.

We have the most complete and up-to-date educational program on the market. We strive for excellence and for you to achieve it too"

Module 1. Fields and Waves

1.1. Mathematics for Field Physics
- 1.1.1. Vectors and Orthogonal Coordinate Systems
- 1.1.2. Gradient of a Scalar Field
- 1.1.3. Divergence of a Vector Field and Divergence Theorem
- 1.1.4. Rotation of a Vector Field and Stokes' Theorem
- 1.1.5. Classification of Fields: Helmholtz Theorem

1.2. Introduction to Waves
- 1.2.1. Wave Equation
- 1.2.2. General Solutions to Wave Equations: D'Alembert Solution
- 1.2.3. Harmonic Solutions to Wave Equations
- 1.2.4. Wave Equation in the Transformed Domain
- 1.2.5. Wave and Standing Wave Propagation

1.3. The Electromagnetic Field and Maxwell's Eq.
- 1.3.1. Maxwell's Equations
- 1.3.2. Continuity on the Electromagnetic Boundaries
- 1.3.3. Wave Equation
- 1.3.4. Monochromatic or Harmonic Dependence Fields

1.4. Propagation of Uniform Plane Waves
- 1.4.1. Wave Equation
- 1.4.2. Uniform Plane Waves
- 1.4.3. Lossless Media Propagation
- 1.4.4. Propagation in Lossy Media

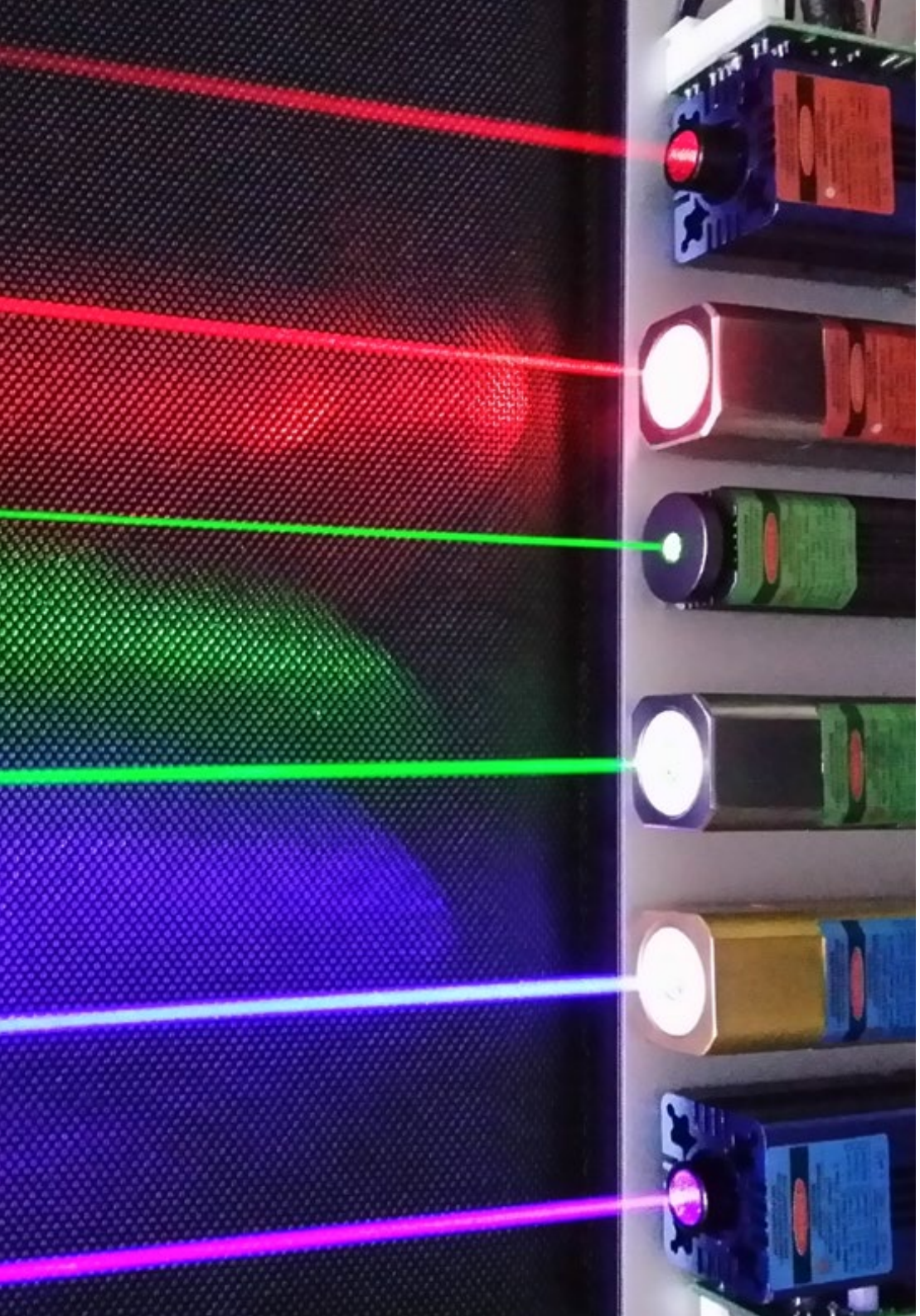
1.5. Polarization and Incidence of Uniform Plane Waves
- 1.5.1. Electric Transversal Polarization
- 1.5.2. Magnetic Transversal Polarization
- 1.5.3. Lineal Polarization
- 1.5.4. Circular Polarization
- 1.5.5. Elliptical Polarization
- 1.5.6. Normal Incidence of Uniform Plane Waves
- 1.5.7. Oblique Incidence of Uniform Plane Waves

1.6. Basic Concepts of Transmission Line Th
- 1.6.1. Introduction
- 1.6.2. Circuit Model of the Transmission Line
- 1.6.3. General Equations of the Transmission Line
- 1.6.4. Wave Equation Solution in Both the Time Domain and the Frequency Domain
- 1.6.5. Low-Loss and No-Loss Lines
- 1.6.6. Power

1.7. Completed Transmission Line
- 1.7.1. Introduction
- 1.7.2. Reflection
- 1.7.3. Stationary Waves
- 1.7.4. Input Impedance
- 1.7.5. Load and Generator Mismatch
- 1.7.6. Transitory Response

1.8. Wave Guide and Transmission Lin
- 1.8.1. Introduction
- 1.8.2. General Solutions for TEM, TE and TM Waves
- 1.8.3. Parallel Plane Guide
- 1.8.4. Rectangular Guide
- 1.8.5. Circular Wave Guide
- 1.8.6. Coaxial Cable
- 1.8.7. Plane Lines

1.9. Microwave Circuits, Smith Chart and Impedance Match
- 1.9.1. Introduction to Microwave Circuits
  - 1.9.1.1. Equivalent Voltages and Currents
  - 1.9.1.2. Impedance and Admittance Parameters
  - 1.9.1.3. Scattering Parameters
- 1.9.2. The Smith Chart
  - 1.9.2.1. Definition of the Smith Chart
  - 1.9.2.2. Simple Calculations
  - 1.9.2.3. Smith's Letter on Admissions
- 1.9.3. Adaptation of Impedances. Simple Stub
- 1.9.4. Adaptation of Impedances. Doble Stub
- 1.9.5. Quarter-Wave Transformers



1.10. Introduction to Antennae
- 1.10.1. Introduction and Brief Historical Review
- 1.10.2. Electromagnetic Spectrum
- 1.10.3. Radiation Diagram
  - 1.10.3.1. System of Coordinates
  - 1.10.3.2. Three Dimensional Diagrams
  - 1.10.3.3. Two Dimensional Diagrams
  - 1.10.3.4. Level Curves
- 1.10.4. Fundamental Parameters of Antennae
  - 1.10.4.1. Radiated Power Density
  - 1.10.4.2. Directivity
  - 1.10.4.3. Gain
  - 1.10.4.4. Polarization
  - 1.10.4.5. Impedances
  - 1.10.4.6. Adaptation
  - 1.10.4.7. Area and Effective Longitude
  - 1.10.4.8. Transmission Equation

This program will allow you to advance in your career comfortably"

04

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"

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

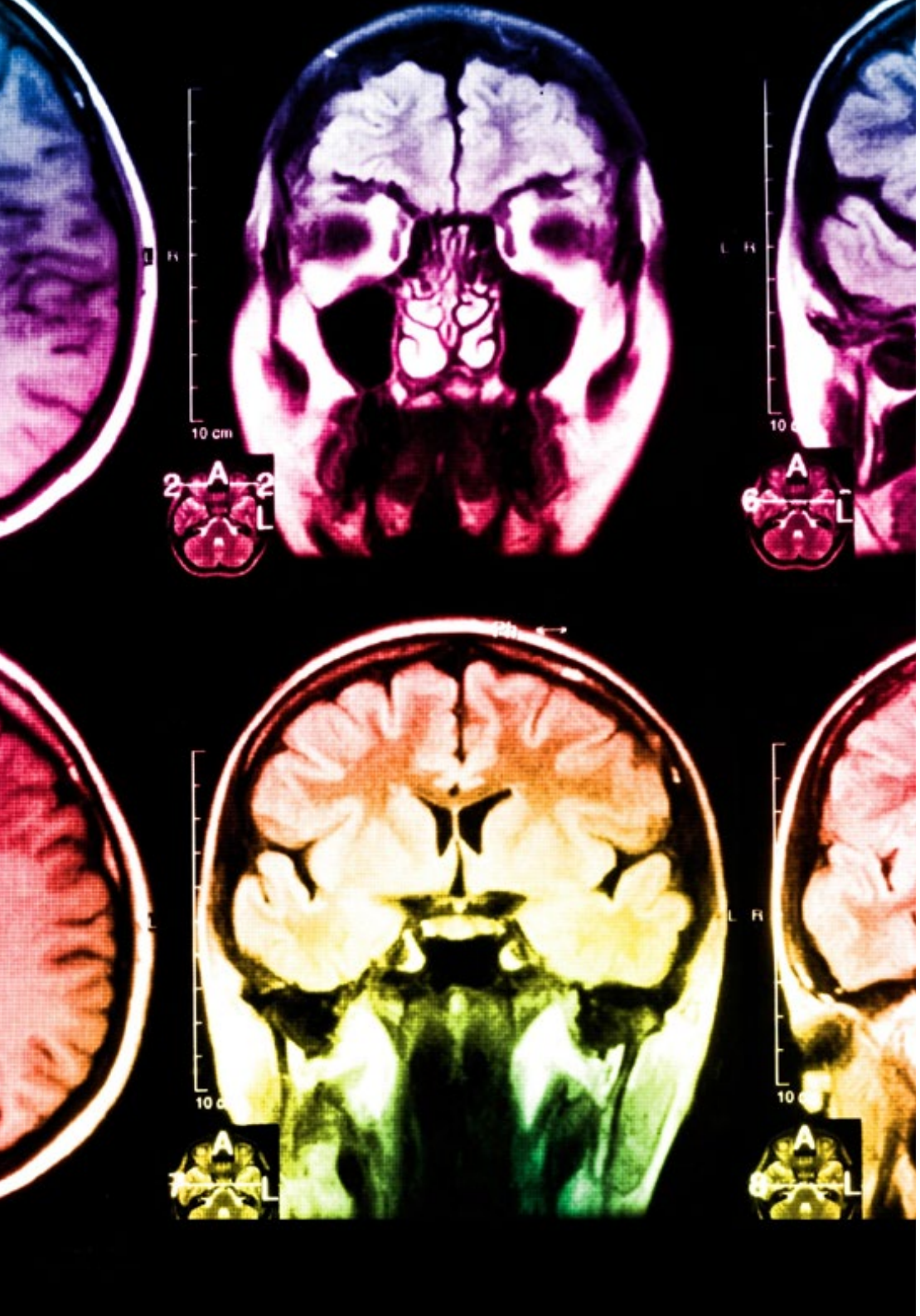
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.

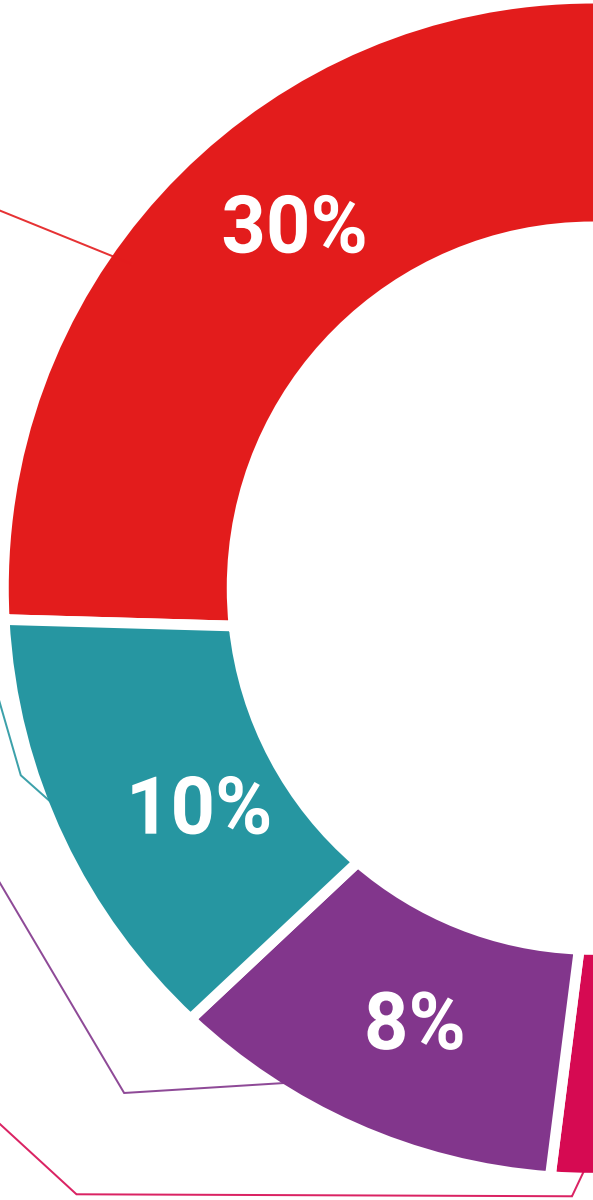
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

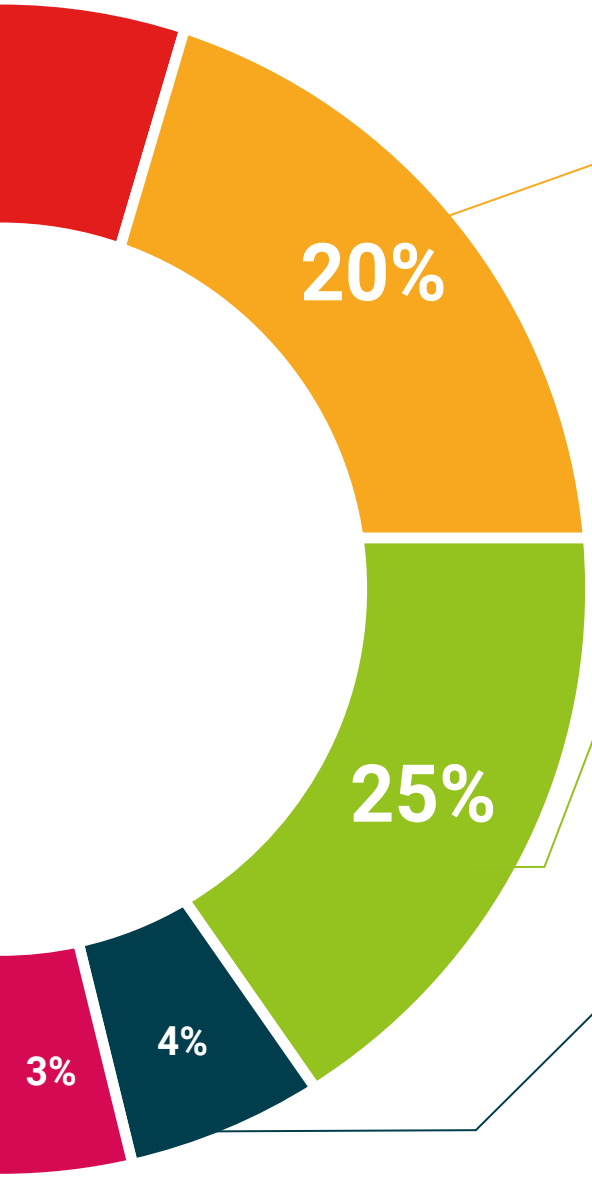
Practising Skills and Abilities

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.

05

Certificate

This Postgraduate Certificate in Fields and Waves 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 Fields and Waves** 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 diploma 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 Fields and Waves**

Official N° of Hours: **150 h.**


tech technological university

Awards the following

CERTIFICATE

to

Mr./Ms. _____, with identification number _____.

For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Fields and Waves

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

Unique TECH Code: AFWORD23S techtitute.com/certificates

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

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