

Postgraduate Certificate Fundamentals of Physics



Postgraduate Certificate Fundamentals of Physics

- » Modality: online
- » Duration: 12 weeks
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

Website: www.techtitute.com/us/engineering/postgraduate-certificate/fundamentals-physics

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01

Introduction

It is impossible to imagine a world without energy, which is the key industrial growth and development, and it is here where physics takes on a stronger role, being of vital importance within production processes applied in industrial engineering. It contributes useful tools such as the study of motion, the use of energy, and the application of forces, among others. So, being trained in its fundamentals is necessary for any professional who works in this operational field. This is how this program becomes the effective solution for those who wish to raise their level of knowledge in Fundamentals of Physics, through a completely online study program over a maximum of 12 weeks based on the most innovative methodology of relearning.





Acquire updated knowledge of Physical Fundamentals in 12 weeks and 100% online"

In productive sectors, the fundamentals of physics can be applied in different processes, such as heat transfer, boilers, air conditioning, refrigeration, manufacturing processes, cutting, cutting force, stamping pressure, hydraulic pressure, electricity, and electrical installations, among others. Thus, although it is not obvious at first glance, knowing the fundamentals of physics is essential for any professional involved in the organizational Industrial Engineering processes.

Likewise, these processes must be adapted to environmental laws, regulations and demands according to the setting. It is impossible to focus on results and propose strategies without ensuring that the proposed solutions minimize environmental impacts, granted that the technological progress, sustainability and tool implementation go hand in hand.

This Postgraduate Certificate in Fundamentals of Physics divides the content into two modules with a specialized syllabus rigorously selected by expert teachers in the field, so professionals gain an in-depth understanding of the key concepts of the general laws of mechanics, kinematics, dynamics and thermodynamics; solve problems related to these key concepts; know how to apply the general laws related to these principles and also develop projects that include the calculations and measurements.

Likewise, this program includes the study of fundamental forces, conservation laws, energy and its components, magnetism and its materials; it will also cover the structure of atoms, subatomic particles, and the bases of quantum physics and relativity. These are among many other aspects that will be covered in depth throughout the program.

All this in a convenient, *online format*, which allows professionals to take on the course load at their own pace and completely free to choose how, where and when to study. From day one, all the content will be available in the virtual classroom, both for consultation and downloading from any device with an Internet connection, which greatly facilitates study time.

This **Postgraduate Certificate in Fundamentals of Physics** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ◆ Practical case studies are presented by experts in Physics
- ◆ The graphic, schematic, and eminently practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- ◆ Practical exercises where the self-assessment process can be carried out to improve learning
- ◆ Its special emphasis on innovative methodologies
- ◆ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ◆ Access to content from any fixed or portable device with an Internet connection



Update your knowledge of fundamentals in physics as applied to industrial operations"

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This Postgraduate Certificate qualifies you to carry out implementation plans that include calculations and measurements”

The program's teaching staff includes professionals from the sector who contribute their work experience to this training 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 training programmed to train 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 student will be assisted by an innovative interactive video system created by renowned and experienced experts.

Get inside knowledge of the study system that is revolutionizing today's digital university landscape.

Add this training to your professional profile and stand out with a specialized degree.



02 Objectives

This update program aims to provide professionals linked to industrial processes with all the basic knowledge of physics in engineering, such as fundamental forces and conservation laws, as well as the problem resolution using key concepts such as: mechanics, kinematics, dynamics and thermodynamics, all adapted to current and future organizational demands. For this purpose, TECH has selected the most updated content, combining theory with the practical knowledge necessary to assimilate all the information.





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With TECH's study system, it is possible to achieve your professional goals. Get trained now”



General Objectives

- ◆ Study physics fundamentals to adapt them to industrial processes
- ◆ Know the laws applied to particle dynamics
- ◆ Study elementary motions in depth
- ◆ Understand alternative methods to solve problems by applying the principle of energy conservation
- ◆ Study thermodynamics and its principles
- ◆ Analyze the fundamental forces and the law of conservation
- ◆ Acquire the most updated knowledge on energy and relativity
- ◆ Understand quantum physics and apply it to industrial processes

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With this training you will be able to apply the general laws of mechanics, kinematics, dynamics and thermodynamics to solve engineering problems”





Specific Objectives

Module 1. Physics I

- ◆ Identify key concepts in the general laws of mechanics, kinematics, dynamics and thermodynamics
- ◆ Solve problems related to key concepts
- ◆ Apply the general laws of mechanics, kinematics, dynamics, and thermodynamics to solve engineering problems
- ◆ Carry out implementation plans involving calculations and measurements

Module 2. Physics II

- ◆ Identify key concepts in the general laws of fields, waves and electromagnetism
- ◆ Acquire basic knowledge of engineering physics, such as fundamental forces and conservation laws
- ◆ Assimilate the structure of atoms and subatomic particles and the basics of quantum physics and relativity
- ◆ Carry out implementation plans involving calculations and measurements

03

Structure and Content

A program dedicated to today's professionals who wish to advance their career while balancing it with their current busy schedule. The deliberate distribution of the contents throughout two modules will allow students to easily grasp the concepts thanks to the *relearning* study methodology of which TECH is a pioneer. This, together with the variety of multimedia resources available, the guidance of renowned experts, the most secure and cutting-edge platforms, serves as the seal of quality for the training.





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The theoretical content presented in dynamic interactive formats and the varied case studies will allow you to advance as efficiently as possible”

Module 1. Physics I

- 1.1. Magnitudes and Units in Physics
 - 1.1.1. Definition and Types
 - 1.1.2. International System of Units
 - 1.1.3. Homogeneity Law
 - 1.1.4. Concept of Error
 - 1.1.5. Basic Vector Calculations
- 1.2. Particle Kinematics
 - 1.2.1. Motion Relativity: Reference and Trajectory Systems
 - 1.2.2. Speed
 - 1.2.3. Acceleration
 - 1.2.4. Basic Kinematic Equations
- 1.3. Elementary Motion
 - 1.3.1. Linear Motion
 - 1.3.2. Compound Motion
 - 1.3.3. Circular Motion
 - 1.3.4. Simple Harmonic Motion
- 1.4. Particle Dynamics
 - 1.4.1. Newton's First Law
 - 1.4.2. Newton's Second Law
 - 1.4.3. Newton's Third Law
 - 1.4.4. Principles of Conservation of Momentum
- 1.5. Fundamental Concepts in Particle Dynamics
 - 1.5.1. Gravitational Fields
 - 1.5.2. Inertia Forces
 - 1.5.3. Frictional Forces
 - 1.5.4. Binding Forces
 - 1.5.5. Type Problems
- 1.6. Work and Energy
 - 1.6.1. Work and Power
 - 1.6.2. Energy and Types
 - 1.6.3. Principle of Energy Conservation
- 1.7. Applying the Principle of Energy Conservation
 - 1.7.1. Alternative Problem Resolution Methods
 - 1.7.2. Free Fall and Frictionless Motion
 - 1.7.3. Spring Systems
 - 1.7.4. Free fall and Motion with Friction: Friction Work
- 1.8. Particle Systems: Introduction to Rigid-Solids
 - 1.8.1. Particle Systems
 - 1.8.2. Center of Mass in a System
 - 1.8.3. Mass Scepter Reference System and Applications
 - 1.8.4. Angular Momentum and Conservation Theorem
 - 1.8.5. Kinetic and Potential Energy and Conservation Theorems
 - 1.8.6. Introduction to Rigid-Solids in Particle Systems
- 1.9. Thermodynamics: First Principle
 - 1.9.1. Introduction to Thermodynamics
 - 1.9.2. Zero Principle in Thermodynamics
 - 1.9.3. Thermal Equation of State
 - 1.9.4. First Principle of Thermodynamics
- 1.10. Thermodynamics: Second Principle and Entropy
 - 1.10.1. Direction in Thermodynamic Processes
 - 1.10.1.1. Spontaneous and Provoked Processes
 - 1.10.1.2. Reversible and Irreversible Processes
 - 1.10.2. Heat to Work Conversion and Vice Versa
 - 1.10.3. Second Principle of Thermodynamics
 - 1.10.4. Entropy and Variation Calculation
 - 1.10.5. Interpreting Entropy

Module 2. Physics II

- 2.1. Fundamental Forces
 - 2.1.1. Newton's Second Law
 - 2.1.2. Fundamental Forces of Nature
 - 2.1.3. Gravitational Force
 - 2.1.4. Electrical Force
- 2.2. Conservation Laws
 - 2.2.1. What is Mass?
 - 2.2.2. Electrical Charge
 - 2.2.3. Millikan's Experiment
 - 2.2.4. Conservation of Linear Momentum
- 2.3. Energy
 - 2.3.1. What Energy Is
 - 2.3.2. Measuring Energy
 - 2.3.3. Energy Types
 - 2.3.4. Dependence on Observer Energy
 - 2.3.5. Potential Energy
 - 2.3.6. Potential Energy Derivation
 - 2.3.7. Energy Conservation
 - 2.3.8. Energy Units
- 2.4. Electrical Field
 - 2.4.1. Static Electricity
 - 2.4.2. Electrical Field
 - 2.4.3. Capacity
 - 2.4.4. Potentiality
- 2.5. Electrical Circuits
 - 2.5.1. Charge Circulation
 - 2.5.2. Batteries
 - 2.5.3. Alternating Current
- 2.6. Magnetism
 - 2.6.1. Introduction to Magnetic Materials
 - 2.6.2. Magnetic Fields
 - 2.6.3. Introduction to Electromagnetism
- 2.7. Electromagnetic Spectrum
 - 2.7.1. Maxwell's Equations
 - 2.7.2. Optics and Electromagnetic Waves
 - 2.7.3. Michelson Morley's Experiment
- 2.8. Atoms and Subatomic Particles
 - 2.8.1. Atoms
 - 2.8.2. Atomic Nuclei
 - 2.8.3. Radioactivity
- 2.9. Quantum Physics
 - 2.9.1. Color and Heat
 - 2.9.2. Photoelectric Effects
 - 2.9.3. Matter Waves
 - 2.9.4. Nature as Probability
- 2.10. Relativity
 - 2.10.1. Gravity, Space and Time
 - 2.10.2. Lorentz Transformations
 - 2.10.3. Speed and Time
 - 2.10.4. Energy, Momentum and Mass



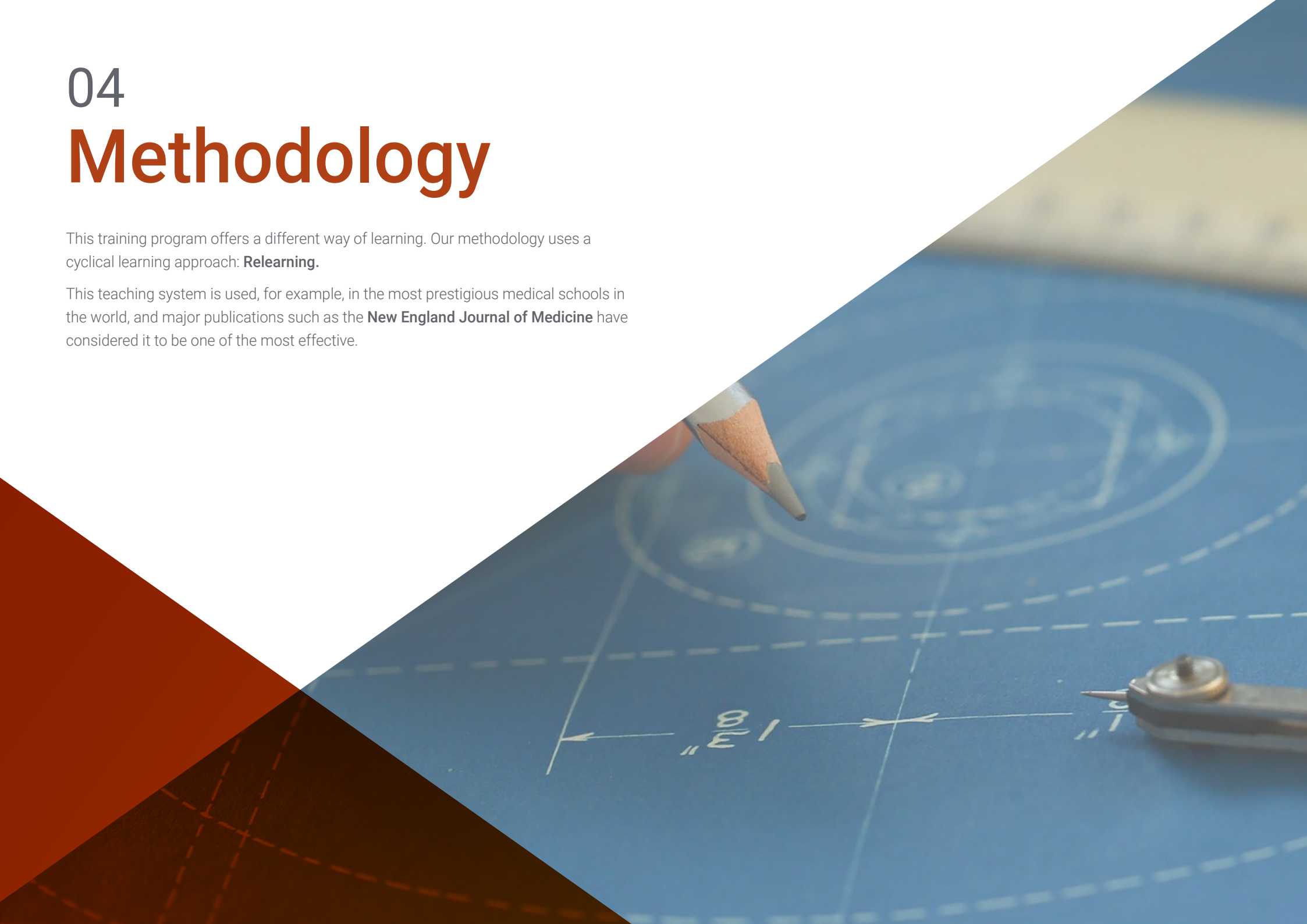
A Postgraduate Certificate that will raise your curriculum profile thanks to its specialized nature. You will attract better job opportunities, start now"

04

Methodology

This training program offers 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

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

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



We are the first online university to combine Harvard Business School case studies with a 100% online learning system based on repetition.



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

A learning method that is different and innovative

This intensive Engineering program at TECH Technological University prepares you to face all the challenges in this field, both nationally and internationally. We are committed to promoting your personal and professional growth, the best way to strive for success, that is why at TECH Technological University you will use Harvard case studies, with which we have a strategic agreement that allows us, to offer you material from the best university in the world.

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

The case method is the most widely used learning system by the best faculties in the world. 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 program, the studies 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 is the first university in the world to combine Harvard University case studies with a 100% online learning system based on repetition, which combines 8 different didactic elements in each lesson.

We enhance Harvard case studies 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 university 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.



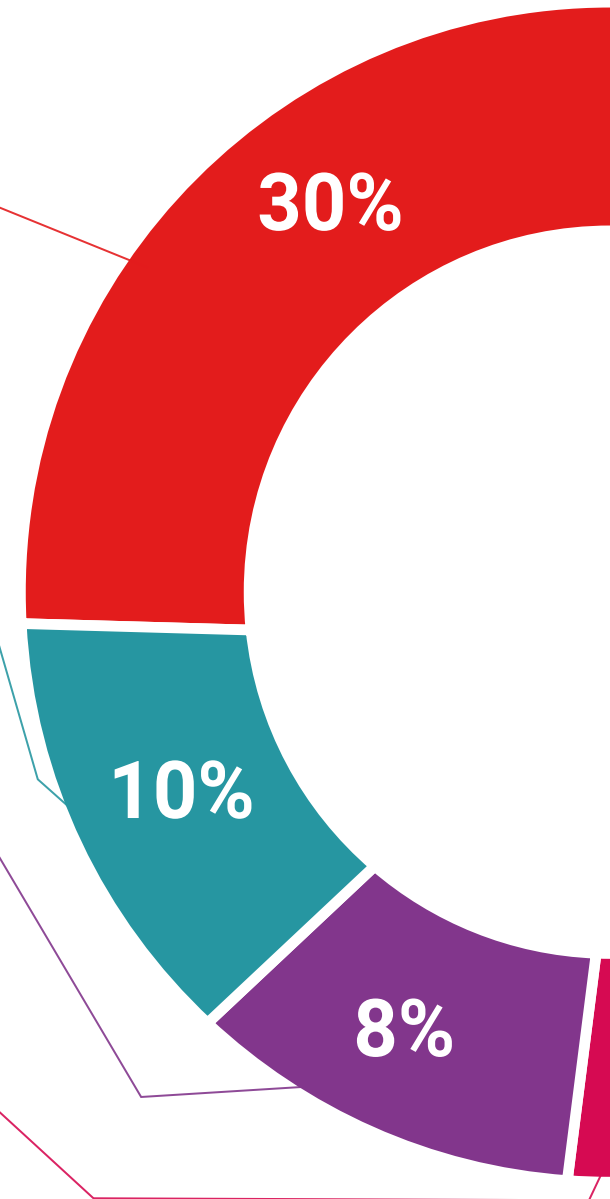
Practising Skills and Abilities

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



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

They will complete a selection of the best case studies in the field used at Harvard. Cases that are presented, analyzed, and supervised by the best senior management 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 multimedia content presentation training Exclusive system 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 your goals.



05

Certificate

The Postgraduate Certificate in Fundamentals of Physics guarantees, in addition to the most rigorous and up-to-date training, access to a qualification issued by TECH - Technological University.





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Include among your qualifications a Postgraduate Certificate in Negotiation and Feasibility: A highly qualified added value for any professional in this field”

This **Postgraduate Certificate in Fundamentals of Physics** contains the most complete and up-to-date program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Certificate** diploma 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 from career evaluation committees.

Title: Postgraduate Certificate in Fundamentals of Physics

Official N° of hours: 300 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.

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



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