

# Postgraduate Certificate Modern Physics



## Postgraduate Certificate Modern Physics

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

Website: [www.techtitute.com/in/engineering/postgraduate-certificate/modern-physics](http://www.techtitute.com/in/engineering/postgraduate-certificate/modern-physics)

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# 01

# Introduction

Much of today's technology would not be possible without the application of modern physics concepts. Thus, ions have been implanted in materials, more precise GPS devices have been created and telescopes have been manufactured to better understand the universe around us. A scenario where Engineering acquires a great relevance by providing the necessary technical knowledge, widely demanded by companies in industrial or technological sectors. This is the reason for the creation of this 100% online degree, which introduces the graduate to the fascinating world of particle physics, medical physics, quantum computing and quantum cryptography. The multimedia resources and the specialized teaching team, which is part of this degree, will be key in this learning and in the progress of the students' professional careers.



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*This 100% online Diploma provides you with the advanced learning in Modern Physics you need to develop your ideas in the field of Engineering”*

Thanks to the study of the behavior of subatomic particles, a great development of Modern Physics and its application in other disciplines such as medicine, technology, economy or ecology has been achieved. In all of them, physics is found as the basis, which has supported the creation of electronic devices, equipment in the health field or that help to understand climate change.

However, in recent years, the goal of creating a quantum computer, which can transmit large amounts of information at a higher speed, is a challenge on which large companies are working. In this scenario, the engineering professional is tremendously useful thanks to his or her technical knowledge, which must also be complemented by an extraordinary mastery of physics. That is why, TECH Technological University has designed this Diploma in Modern Physics, which offers in 6 weeks, the most advanced and intensive learning from the hand of a specialized teaching team, responsible for developing a comprehensive and innovative content.

In this way, students will find in this program multimedia resources that will lead them to delve deeper into particle physics, geophysics and atmospheric physics, astrophysics or cosmology. In addition, the graduate will have the opportunity to address the most relevant information about the quantum world throughout the 300 hours of classes.

All this with a study plan that presents a theoretical-practical approach, and that counts with the Relearning method, based on the reiteration of content. In addition, thanks to this system, the engineering professionals will be able to progress through the course in a more natural way, reduce the the long hours of study.

This academic institution offers a 100% online diploma, without classes, with fixed and flexible schedules. Students will The Student Body only need an electronic device with an Internet connection to access the syllabus whenever suits them. An ideal academic option for those seeking a university degree within everyone's reach and compatible with the most demanding responsibilities.

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

- ◆ Practical case studies are presented by experts in Physics
- ◆ 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



*Enroll now and start your professional career as an engineer with Modern Physics”*



“

*No attendance, no classes with fixed schedules. This program Benefits you the flexibility you are looking in a 100% online university Certificate”*

*Delve comfortably from any device with an internet connection into the information offered by this program on dark matter and dark energy.*

*This Diploma will take you to explore Qubits, logic gates or quantum programs.*

The program's teaching staff includes professionals from the sector who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

Its 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 an immersive education programmed to learn in real situations.

The design of this program focuses on Problem-Based Learning, by means of which the professional must try to solve the different professional practice situations that are presented throughout the academic course. For this purpose, the student will be assisted by an innovative interactive video system created by renowned experts.



# 02

# Objectives

This Diploma has been designed with the main objective of offering students the most detailed and updated knowledge on Modern Physics. To this end, it offers the most innovative pedagogical tools and an expert teaching team, with which you can resolve any doubts that may arise with the syllabus. In addition, thanks to the case studies of this program, you will be able to integrate its methodology into your daily professional performance.





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*Thanks to the multimedia pills provided by this degree you will achieve more easily the knowledge in Modern Physics, which will boost your professional career”*





## General Objectives

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- ◆ Be familiar with new developments and advances in the field of physics, both theoretical and experimental
- ◆ Develop communication skills, to write reports and documents, or to make effective presentations of these
- ◆ Acquire essential notions about the quantum world



*You will acquire the necessary skills to use software to solve and model physical problems”*







## Specific Objectives

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- ◆ Identify and assess the presence of physical processes in daily life and in both specific (medical applications, fluid behavior, optics or radiation protection) and common scenarios (electromagnetism, thermodynamics or classical mechanics)
- ◆ Be able to use computer tools to solve and model physical problems



03

# Structure and Content

The syllabus of this Diploma has been designed to provide the graduate with the most advanced and essential information in the field of Modern Physics. For this, TECH Technological University together with the team of specialized teachers has developed multimedia resources (video summaries, outlines, detailed videos), complementary readings and case studies that will take you deeper into particle physics, astrophysics, cosmology or quantum computation.





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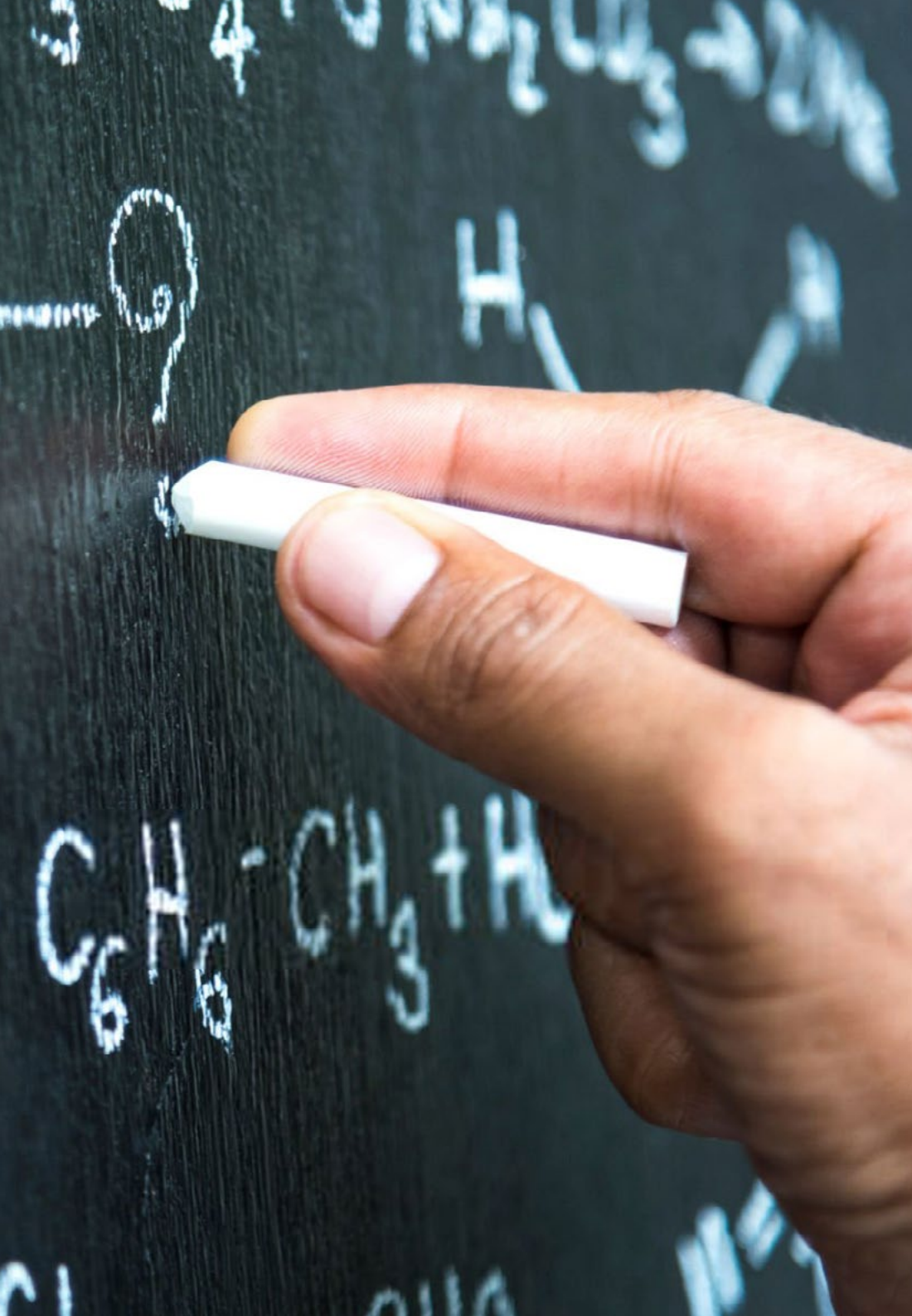
*A syllabus that will bring you up to date  
on the latest advances in quantum  
computing, astrology and nuclear physics”*

## Module 1. Introduction to Modern Physics

- 1.1. Introduction to Medical Physics
  - 1.1.1. How to Apply Physics to Medicine
  - 1.1.2. Energy of Charged Particles in Tissues
  - 1.1.3. Photons through Tissues
  - 1.1.4. Applications
- 1.2. Introduction to Particle Physics
  - 1.2.1. Introduction and Objectives
  - 1.2.2. Quantified Particles
  - 1.2.3. Fundamental Forces and Charges
  - 1.2.4. Particle Detection
  - 1.2.5. Classification of Fundamental Particles and Standard Model
  - 1.2.6. Beyond the Standard Model
  - 1.2.7. Current Generalization Theories
  - 1.2.8. High Energy Experiments
- 1.3. Particle Accelerators
  - 1.3.1. Particle Acceleration Processes
  - 1.3.2. Linear Accelerators
  - 1.3.3. Cyclotrons
  - 1.3.4. Synchrotrons
- 1.4. Introduction to Nuclear Physics
  - 1.4.1. Nuclear Stability
  - 1.4.2. New Methods in Nuclear Fission
  - 1.4.3. Nuclear Fusion
  - 1.4.4. Synthesis of Superheavy Elements
- 1.5. Introduction to Astrophysics
  - 1.5.1. The Solar System
  - 1.5.2. Birth and Death of a Star
  - 1.5.3. Space Exploration
  - 1.5.4. Exoplanets





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- 1.6. Introduction to Cosmology
    - 1.6.1. Distance Calculation in Astronomy
    - 1.6.2. Velocity Calculations in Astronomy
    - 1.6.3. Dark Matter and Energy
    - 1.6.4. The Expansion of the Universe
    - 1.6.5. Gravitational Waves
  - 1.7. Geophysics and Atmospheric Physics
    - 1.7.1. Geophysics
    - 1.7.2. Atmospheric Physics
    - 1.7.3. Meteorology
    - 1.7.4. Climate Change
  - 1.8. Introduction to Condensed Matter Physics
    - 1.8.1. Aggregate States of Matter
    - 1.8.2. Matter Allotropes
    - 1.8.3. Crystalline Solids
    - 1.8.4. Soft Matter
  - 1.9. Introduction to Quantum Computing
    - 1.9.1. Introduction to the Quantum World
    - 1.9.2. Qubits
    - 1.9.3. Multiple Qubits
    - 1.9.4. Logic Gates
    - 1.9.5. Quantum Programs
    - 1.9.6. Quantum Computers
  - 1.10. Introduction to Quantum Cryptography
    - 1.10.1. Classic Information
    - 1.10.2. Quantum Information
    - 1.10.3. Quantum Encryption
    - 1.10.4. Protocols in Quantum Cryptography

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.





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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"*



## 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.

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*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 is the most widely used learning system in 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 effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 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

The Postgraduate Certificate in Modern Physics 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 Modern 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** 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 Modern Physics**

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.

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



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



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