

Postgraduate Certificate  
Disciplinary Training  
in Physics and Chemistry



## Postgraduate Certificate Disciplinary Training in Physics and Chemistry

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Global University
- » Credits: 6 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/education/postgraduate-certificate/disciplinary-training-physics-chemistry](http://www.techtute.com/us/education/postgraduate-certificate/disciplinary-training-physics-chemistry)

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# 01

# Introduction

Science is continuously advancing and that is why teaching professionals must be aware of such progress. In this way, Physics and Chemistry teachers will be able to convey to their students the most accurate and current knowledge. For this reason, TECH has developed this 100% online educational program, which provides an advanced syllabus on the most recent milestones in these disciplines, their historical evolution and the implementation of dynamic activities in the classroom. To this end, graduates have access to innovative, first-class teaching materials, developed by a teaching team with a long professional career in the education sector.





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*This 100% online university program provides you with renewed and precise knowledge to teach Physics and Chemistry in High School Education"*

Advances in physics and chemistry such as the electromagnetic spectrum, lasers, fission and fusion processes and nanotechnology have benefited society as a whole. Likewise, the continuous advances in these disciplines deserve to be known by High School Education students and by an up-to-date and highly prepared teaching staff.

In this way, teachers who wish to incorporate the latest and most recent material must be aware of the lines of research, practical applications or existing theories. A broad content that TECH includes in this Postgraduate Certificate in Disciplinary Training in Physics and Chemistry.

It is an advanced and intensive syllabus, taught in an online format, which provides the graduate with the most comprehensive information on the history of Physics and Chemistry, its impact on the environment, technology and everyday life. In addition, this program contains additional multimedia material that will lead you to a much more dynamic update, getting into laboratory practices, experiment design and the required safety standards.

This level of learning is perfectly compatible with personal and professional responsibilities. This proposal does not require attendance, nor does it have classes with fixed schedules, which gives students the freedom to access the content hosted on the virtual platform, whenever and wherever they wish.

The teacher only needs an electronic device (cell phone, computer or tablet) with an Internet connection to be able to access, at any time of the day, the syllabus of this Postgraduate Certificate. All this is an excellent opportunity to progress in the teaching sector through a quality and flexible qualification.

This **Postgraduate Certificate in Disciplinary Training in Physics and Chemistry** contains the most complete and up-to-date educational program on the market. Its most notable features are:

- ♦ The development of case studies presented by experts in teaching in High School Education
- ♦ 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



*An academic option without attendance or classes with fixed schedules, fully compatible with your personal and professional life"*

“

*Catch up on the technological progress we enjoy today thanks to the contributions of Physics and Chemistry”*

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 allow the professional a situated and contextual learning, that is, a simulated environment that will provide an immersive training programmed to train in real situations.

The design of this program focuses on Problem-Based Learning, in which the professional will have to try to solve the different professional practice situations that will arise throughout the academic course. This will be done with the help of an innovative system of interactive videos made by renowned experts.

*Take your students to live unique experiences with the creation of a virtual laboratory in Physics and Chemistry thanks to this program.*

*This program will allow you to give much more attractive sessions in Physics to teenage students about to finish High School.*



# 02

# Objectives

The teaching professional who attends this educational program will obtain, throughout the 6 weeks of duration, an update on the contents and competencies required to teach the disciplines of Physics and Chemistry. For this purpose, an excellent specialized teaching team and innovative teaching resources will provide a theoretical-practical approach to these subjects.







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*Access additional content that will allow you to delve into the impact of physics and chemistry on the environment”*



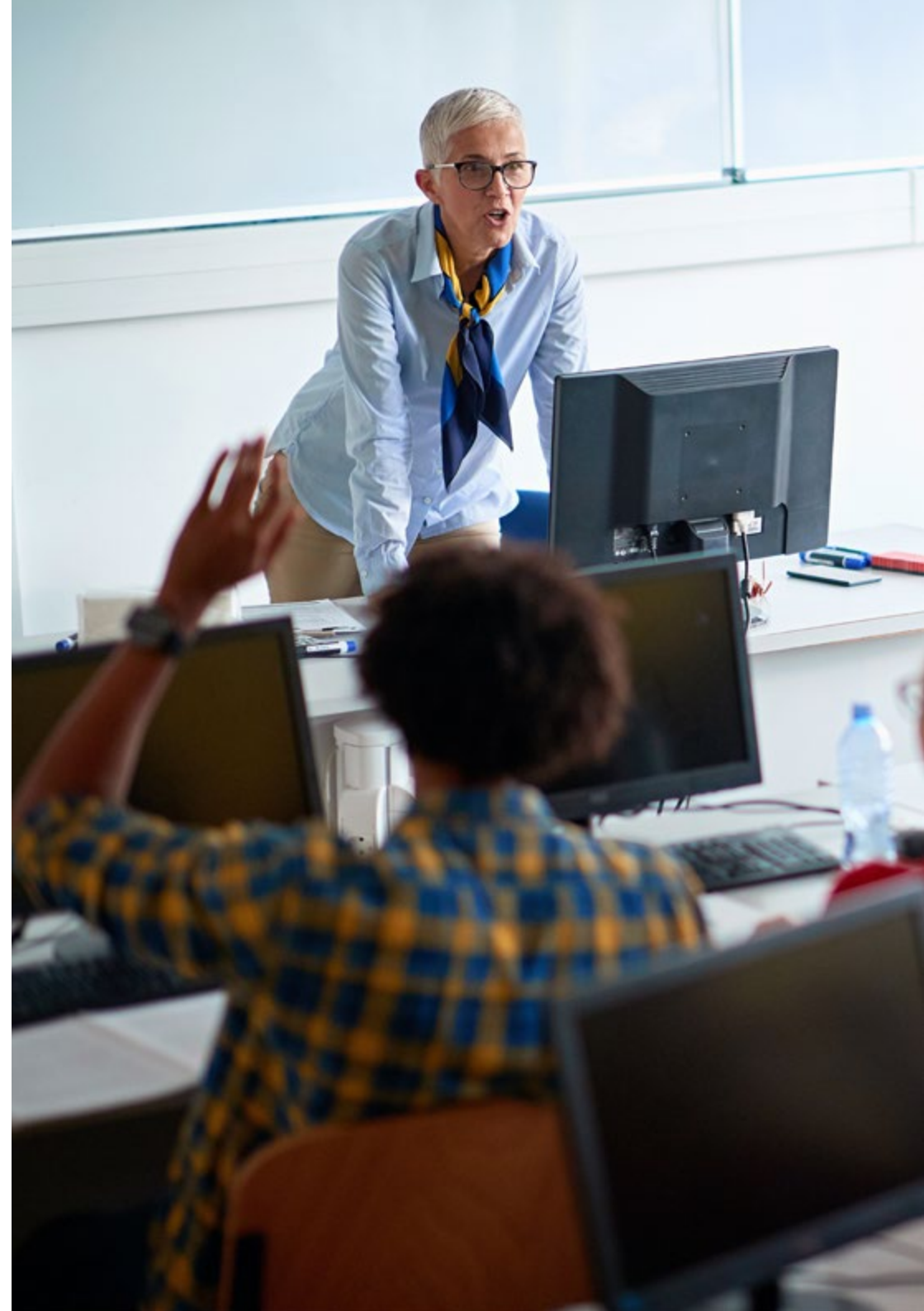
## General Objectives

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- ♦ Introduce students to the world of teaching, from a broad perspective that provides them with the necessary skills for the performance of their work
- ♦ Get to know the new tools and technologies applied to teaching
- ♦ Learn about the different options and ways the teacher can work in their workplace
- ♦ Foster the acquisition of communication and knowledge transmission skills and abilities
- ♦ Encourage continuing education for students



*Update and improve your daily practice as a teacher through a program designed by and for teaching professionals like you. Enroll now"*





## Specific Objectives

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- ♦ Define a chronological line from the Ancient Age to the Contemporary Age
- ♦ Gain knowledge about the the most important events of the different historical periods
- ♦ Mention some of the names of the most prominent professors of chemistry in the 19th century
- ♦ Learn about the origin and classification of the elements
- ♦ Understand the importance of teaching history in Science
- ♦ Introduce a proposal to introduce the historical approach in the classroom within the teaching of science

03

# Course Management

The management and teaching team that make up this Postgraduate Certificate have been selected by TECH based on their knowledge of the educational system, didactics and the most appropriate methodology in High School Education. In this way, students will have access to current and comprehensive information from real experts that will allow them to update the disciplines of Physics and Chemistry.





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*The teaching team of this university program has contributed all its knowledge and experience in the educational field to offer the highest quality content"*

## Management



### Dr. Barboyón Combey, Laura

- ♦ Teacher of Primary Education and Postgraduate Studies
- ♦ Teacher in Postgraduate University Studies of High School Teacher Formation
- ♦ Teacher of Primary Education in several schools
- ♦ Doctor in Education from the University of Valencia
- ♦ Master's Degree in Psychopedagogy from the University of Valencia
- ♦ Degree in Primary School Education with a major in English Teaching from the Catholic University of Valencia San Vicente Mártir



# 04

# Structure and Content

The syllabus of this university program is designed to provide throughout the 180 teaching hours the necessary and up-to-date content and material on Physics and Chemistry and its adaptation to the educational level of High School Education. For this purpose, it has an advanced syllabus and teaching tools that facilitate a dynamic and much more visual learning. In addition, thanks to the Relearning system, the teacher will obtain knowledge in an agile way and without investing a great amount of study hours.







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*Access the library of multimedia resources at any time of the day through your Tablet with an Internet connection”*

## Module 1. Complements for the Disciplinary Training in Physics and Chemistry

- 1.1. History of Chemistry
  - 1.1.1. Starting from the Beginning: Antiquity
  - 1.1.2. From the Middle Ages to the Renaissance to the Modern Age
  - 1.1.3. Nineteenth Century Chemistry Teachers and the Chemical Industry
  - 1.1.4. Classification of the Elements
  - 1.1.5. What does History Tell Teachers?
  - 1.1.6. History of Science in the Classroom
  - 1.1.7. Classroom Proposal: The Development of Atomic Theory
- 1.2. History of Physics
  - 1.2.1. Classical Antiquity
  - 1.2.2. The Middle Ages
  - 1.2.3. From the Renaissance to the Baroque
  - 1.2.4. The Enlightenment
  - 1.2.5. Liberalism
  - 1.2.6. The Present Era
  - 1.2.7. Role of the History of Physics in the Teaching of Physics
  - 1.2.8. Example of Activities with a Historical Approach
  - 1.2.9. Conclusions and Future Perspectives of Teaching through History
- 1.3. Physics and Chemistry in Technology and Society
  - 1.3.1. Is Science Necessary?
  - 1.3.2. Physics and its Advances for Society: The Electromagnetic Spectrum, Laser, and Fission and Fusion Processes
  - 1.3.3. Physics, Chemistry and Nanotechnology
  - 1.3.4. Chemistry in Food and Health
- 1.4. Impact of Physics and Chemistry on the Environment
  - 1.4.1. Environmental Health
  - 1.4.2. General Concepts about Contaminants
  - 1.4.3. Water Pollution
  - 1.4.4. Soil Pollution
  - 1.4.5. Atmospheric Pollution
  - 1.4.6. Waste Analysis
  - 1.4.7. Carbon Cycle
  - 1.4.8. Climate Change
- 1.5. Chemical Process, Risk, Green Chemistry, Biomass
  - 1.5.1. Chemical Process
  - 1.5.2. Green Chemistry
  - 1.5.3. Global Objectives of Sustainable Chemistry
  - 1.5.4. Example of Biomass
- 1.6. Everyday Situations for Physics and Chemistry: Problem Solving Examples
  - 1.6.1. The Origins, Historical Review
  - 1.6.2. Disconnection between Science and Everyday Life
  - 1.6.3. Development of Everyday Situations in the Context of Physics and Chemistry
  - 1.6.4. Elaboration and Sequencing of Sessions Based on the Development of Everyday Science in the Classroom
  - 1.6.5. Resources to be Used in the Application of Everyday Science
  - 1.6.6. Teaching through Problems
  - 1.6.7. Solving Everyday Chemistry Problems
  - 1.6.8. Solving Everyday Physics Problems
- 1.7. Educational and Cultural Value of Physics and Chemistry
  - 1.7.1. Science in ESO from the Perspective of Scientific Literacy
  - 1.7.2. Chemistry in High School: Chemistry in Context, Historical Evolution
  - 1.7.3. Physics in High School: More Attractive Physics
- 1.8. The Laboratory of Physics and Chemistry
  - 1.8.1. Instruments and Laboratory Equipment
  - 1.8.2. Measurement of Experimental Quantities and Calculation of Errors
  - 1.8.3. Treatment of Experimental Results
  - 1.8.4. Magnitudes, Units and Symbols
  - 1.8.5. The Use of Sensors and Automatic Data Acquisition Equipment in Practical Work
  - 1.8.6. Examples of Laboratory Practices Using Sensors
  - 1.8.7. The Virtual Laboratory in Physics and Chemistry



- 1.9. Design of Didactic Experiments
  - 1.9.1. Critical Analysis of the Usual Laboratory Practices
  - 1.9.2. Laboratory Practices as Research
  - 1.9.3. An illustrative Example: The Study of the Fall of Bodies
- 1.10. Safety Rules in the Laboratory
  - 1.10.1. Laboratory Work Habits
  - 1.10.2. Handling and Storage of Chemical Products
  - 1.10.3. Procedures to be Followed in the Event of an Accident
  - 1.10.4. Waste Disposal and Management

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*This program will allow you to design laboratory activities oriented to improve the practice of your High School students”*

05

# 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 Education School we use the Case Method

In a given situation, what should a professional do? Throughout the program students will be presented with multiple simulated cases based on real situations, where they will have to investigate, establish hypotheses and, finally, resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method.

*With TECH, educators can experience a learning methodology that is shaking the foundations of traditional universities around the world.*



*It is a technique that develops critical skills and prepares educators to make decisions, defend their arguments, and contrast opinions.*

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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. Educators who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. The learning process is solidly focused on practical skills that allow educators to better integrate the knowledge into daily practice.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life teaching.
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.

Our University is the first in the world to combine case studies with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, which represent a real revolution with respect to simply studying and analyzing cases.



*Educators 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 85,000 educators with unprecedented success in all specialties. 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 specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to 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 our 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 specialist educators who teach the course, specifically for the course, so that the teaching content is really 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, with the latest educational advances, and to the forefront of Education. All this, first-hand, with the maximum rigor, explained and detailed for your assimilation and understanding. And best of all, you can watch them as many times as you want.



### Interactive Summaries

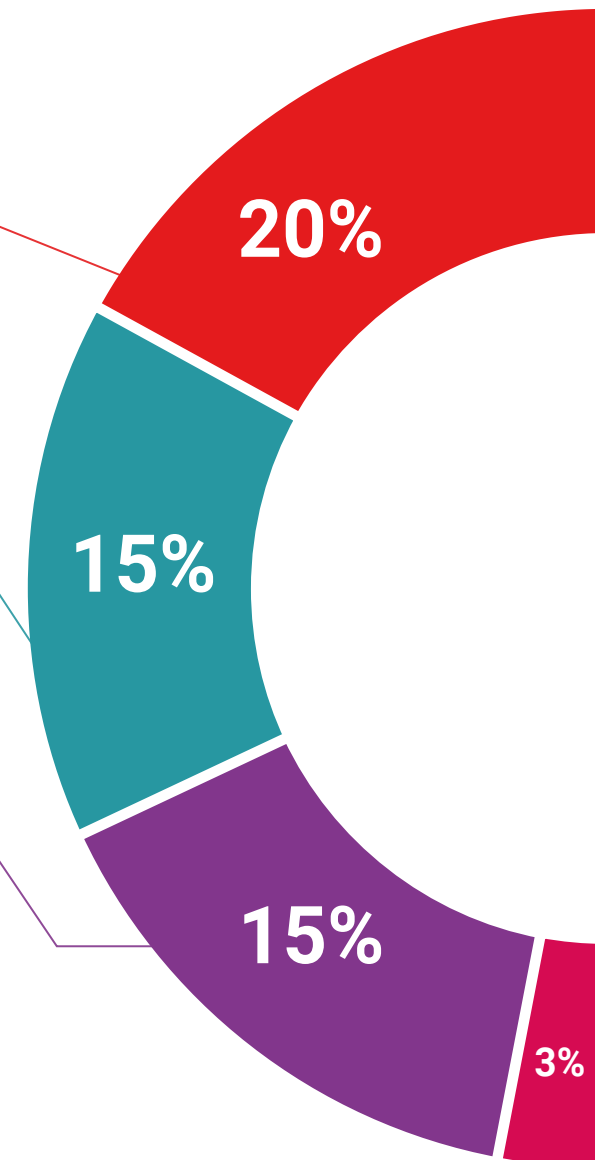
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive multimedia content presentation training Exclusive system was awarded by Microsoft as a "European Success Story".



### 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.





**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 your 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 Disciplinary Training in Physics and Chemistry guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.



The image features two black graduation caps (mortarboards) against a blue sky with light clouds. The caps are positioned diagonally, with one in the foreground and another slightly behind it. The background is split into a white lower half and a red upper half by a diagonal line.

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

This program will allow you to obtain your **Postgraduate Certificate in Disciplinary Training in Physics and Chemistry** endorsed by **TECH Global University**, the world's largest online university.

**TECH Global University** is an official European University publicly recognized by the Government of Andorra ([official bulletin](#)). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Disciplinary Training in Physics and Chemistry**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



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



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