

# Postgraduate Certificate Structural Steel





## Postgraduate Certificate Structural Steel

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

Website: [www.techtitute.com/pk/engineering/postgraduate-certificate/structural-steel](http://www.techtitute.com/pk/engineering/postgraduate-certificate/structural-steel)

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# 01

# Introduction

Structural Steel remains one of the most widely used materials in construction due to its excellent mechanical properties and high strength. However, in an environment of constant technological evolution and sustainability, the design and construction of steel structures requires highly trained engineers. As such, the present program responds to this need through a syllabus focused on the general principles of design and construction of steel structures, as well as the ultimate and serviceability limit states. In addition, the program also deals with steel structures in the event of fire and their temperature calculation. All this in a 100% online format and using the most effective methodology, Relearning.





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*You will master the design and construction of innovative and sustainable steel structures with this TECH's Postgraduate Certificate. Don't wait any longer and enroll today!"*



Structural Steel is one of the most widely used materials in the construction of buildings, bridges, towers and other structural elements. Despite the growing popularity of other materials such as concrete and wood, steel remains a preferred choice due to its high strength and durability. However, the design and construction of steel structures requires a thorough understanding of structural principles and the latest technologies in the industry.

The Postgraduate Certificate in Structural Steel focuses on providing comprehensive education in this field, covering from the general principles of design and construction of steel structures to the ultimate and serviceability limit states, as well as the means of joining by means of bolts and welds. In addition, the program focuses on steel structures against fire and their temperature calculation.

In addition, the program is taught 100% online, which allows students to adapt their learning to their schedule and pace of life. In the same line, the methodology used by TECH for all its programs, Relearning, focuses on the student as the central axis of the learning process, which means that graduates are primarily responsible for their own learning.

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

- ◆ The development of practical cases presented by experts in Civil Engineering
- ◆ The graphic, schematic, and practical contents with which they are created, provide 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
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



*Enroll and you will discover modern structural steels and their applications in this Postgraduate Certificate in Structural Steel from TECH"*

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*Enroll in a university education that will allow you to acquire advanced knowledge, reducing the hours of study with the Relearning system”*

The program includes in its teaching staff professionals from the sector who bring to this program the experience of their work, as well as recognized 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. This will be done with the help of an innovative system of interactive videos made by renowned experts.

*Enjoy a learning experience tailored to your needs with the 100% online modality, which will allow you to study at your own pace and according to your personal schedule.*

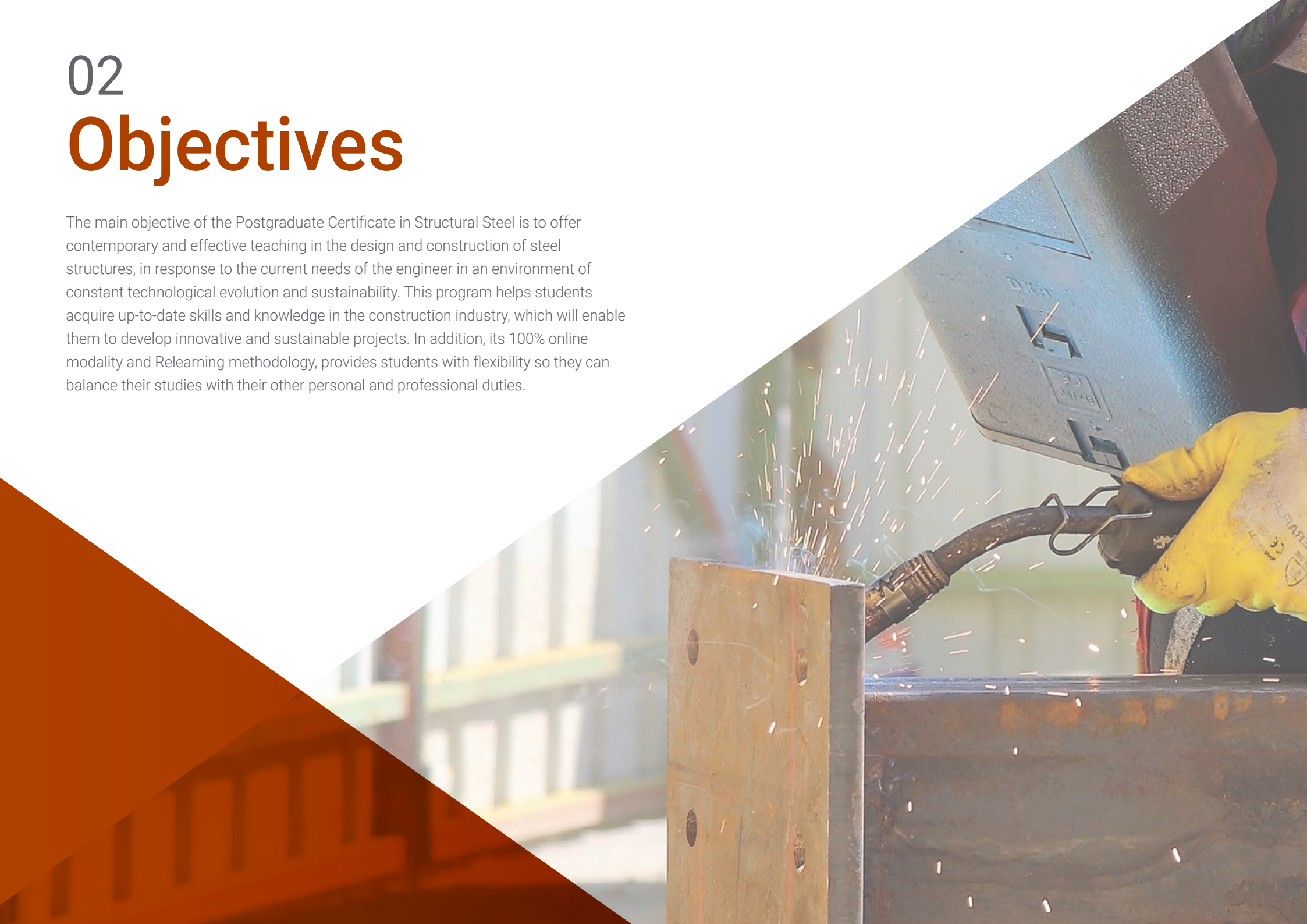
*Take advantage of TECH's virtual library where you will have access to the most up-to-date and relevant information on the design and construction of steel structures.*



# 02

# Objectives

The main objective of the Postgraduate Certificate in Structural Steel is to offer contemporary and effective teaching in the design and construction of steel structures, in response to the current needs of the engineer in an environment of constant technological evolution and sustainability. This program helps students acquire up-to-date skills and knowledge in the construction industry, which will enable them to develop innovative and sustainable projects. In addition, its 100% online modality and Relearning methodology, provides students with flexibility so they can balance their studies with their other personal and professional duties.







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*You will learn effective tools and strategies for structural calculation and analysis, as well as for the appropriate choice of connecting means in different situations thanks to this program"*



## General Objectives

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- ◆ Learn in an autonomous way new knowledge and techniques suitable for Civil Engineering
- ◆ Know in detail the nature, characteristics and performance of new construction materials that have been investigated in recent years
- ◆ Understand and use the language of engineering, as well as the terminology of Civil Engineering
- ◆ Delve in a scientific and technical way in the exercise of the profession of Technical Engineer of Public Works with knowledge of the functions of consultancy, analysis, design, calculation, project, construction, maintenance, conservation and operation







## Specific Objectives

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- ◆ Design, plan, build and maintain reinforced concrete and steel structures based on knowledge of the fundamentals of the behavior of these structures
- ◆ Analyze and understand how the characteristics of structures influence their behavior
- ◆ Apply knowledge of the resistant performance of structures in order to dimension them according to existing standards and using analytical and numerical calculation methods

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*Achieve your career goals in the steel structure construction industry with an up-to-date and comprehensive program that will allow you to stand out as an expert in the field"*



# 03

## Structure and Content

This unique program has been comprehensively structured, covering everything from an introduction to steel structural design to serviceability limit states, steel sections, and steel structures in fire. Therefore, the contents are focused on providing a complete education in which the graduates will learn to use effective tools and strategies for structural calculation and analysis, as well as for the appropriate choice of the means of connection in different situations. All this under a 100% online modality and the most effective methodology.







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*You will be able to develop innovative and sustainable projects that meet the current needs of the engineer thanks to this TECH program"*

## Module 1. Structural Steel

- 1.1. Introduction to Structural Steel Design
  - 1.1.1. Advantages of Steel as a Structural Material
  - 1.1.2. Disadvantages of Steel as a Structural Material
  - 1.1.3. Early Uses of Iron and Steel
  - 1.1.4. Steel Profiles
  - 1.1.5. Stress-Strain Relationships of Structural Steel
  - 1.1.6. Modern Structural Steels
  - 1.1.7. Use of High-Strength Steels
- 1.2. General Principles of Design and Construction of Steel Structures
  - 1.2.1. General Principles of Design and Construction of Steel Structures
  - 1.2.2. Structural Design Work
  - 1.2.3. Responsibilities
  - 1.2.4. Specifications and Building Codes
  - 1.2.5. Economical Design
- 1.3. Calculation Basis and Structural Analysis Models
  - 1.3.1. Calculation Basis
  - 1.3.2. Structural Analysis Models
  - 1.3.3. Determination of Areas
  - 1.3.4. Sections
- 1.4. Ultimate Limit States I
  - 1.4.1. General Aspects. Strength Limit State of the Sections
  - 1.4.2. Equilibrium Limit State
  - 1.4.3. Strength Limit State of the Sections
  - 1.4.4. Axial Force
  - 1.4.5. Bending Moment
  - 1.4.6. Shear Stress
  - 1.4.7. Torsion
- 1.5. Ultimate Limit States II
  - 1.5.1. Instability Limit States
  - 1.5.2. Elements Subjected to Compression
  - 1.5.3. Elements Subjected to Flexion
  - 1.5.4. Elements Subjected to Compression and Bending





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- 1.6. Ultimate Limit States III
    - 1.6.1. Ultimate Stiffness Limit State
    - 1.6.2. Longitudinally Stiffened Elements
    - 1.6.3. Web Shear Buckling
    - 1.6.4. Resistance of Web to Transverse Concentrated Loads
    - 1.6.5. Compressed Flange Induced Web Buckling
    - 1.6.6. Stiffeners
  - 1.7. Serviceability Limit States
    - 1.7.1. General Aspects
    - 1.7.2. Deformities Limit States
    - 1.7.3. Vibrations Limit States
    - 1.7.4. Limit State of Transverse Deformation in Slender Panels
    - 1.7.5. Limit State of Local Plasticization
  - 1.8. Connecting Means: Bolts
    - 1.8.1. Connecting Means: General Aspects and Classifications
    - 1.8.2. Bolted Joints - Part 1: General Aspects. Bolt Types and and Constructive Arrangements
    - 1.8.3. Bolted Joints - Part 2: Calculation
  - 1.9. Connecting Means: Welding
    - 1.9.1. Welded Joints: Part 1: General Aspects. Classifications and Defects
    - 1.9.2. Welded Joints Part 2: Constructive Arrangements and Residual Stresses
    - 1.9.3. Welded Joints. Part 3: Calculation
    - 1.9.4. Design of Beam and Column Connections
    - 1.9.5. Supporting Devices and Column Bases
  - 1.10. Fire Resistance of Steel Structures
    - 1.10.1. General Considerations
    - 1.10.2. Mechanical and Indirect Actions
    - 1.10.3. Properties of Materials Subjected to the Action of Fire
    - 1.10.4. Strength Testing of Prismatic Elements Subjected to the Action of Fire
    - 1.10.5. Testing the Resistance of Joints
    - 1.10.6. Calculation of Temperatures in Steel

# 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 Structural Steel 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 Structural Steel** 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 Structural Steel**

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



## Postgraduate Certificate Structural Steel

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

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