

# Postgraduate Diploma Lighting and Control Systems





## Postgraduate Diploma Lighting and Control Systems

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

Website: [www.techtute.com/in/engineering/postgraduate-diploma/postgraduate-diploma-lighting-control-systems](http://www.techtute.com/in/engineering/postgraduate-diploma/postgraduate-diploma-lighting-control-systems)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Course Management

---

*p. 12*

04

Structure and Content

---

*p. 16*

05

Methodology

---

*p. 22*

06

Certificate

---

*p. 30*

01

# Introduction

Learn to analyze the different installations, technologies and control systems applied to energy-saving in buildings, with this high-level program. A unique opportunity to specialize in Lighting and Control Systems, from professionals with extensive experience in the sector.



A hand is pointing at a screen displaying a bar chart with a green checkmark. The chart has five bars of increasing height, colored from bottom to top: red, orange, yellow, light green, and dark green. A green checkmark is positioned above the top bar. The background is a dark brown gradient with a white diagonal shape.

“

*Engineering professionals must continue their training during their careers to adapt to new developments in the field”*

The Postgraduate Diploma in Lighting and Control Systems addresses the complete range of issues involved in this field, both in the residential and tertiary sectors. Its study has a clear advantage over other programs that focus on specific blocks, which prevents the student from knowing the interrelationship with other areas included in the multidisciplinary field of Lighting and Control Systems.

Throughout these months of specialization, you will learn how to develop and apply efficient lighting systems, as well as how to use control systems that allow energy-saving. You will also gain the necessary knowledge in the application of the principles of lighting technology and its properties, differentiating the aspects that contribute to energy-saving.

With the completion and passing of the assessments of this educational program, the student will obtain a solid knowledge of Lighting and Control Systems.

As it is a 100% online Postgraduate Diploma, 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 Diploma in Lighting and Control Systems** contains the most complete and up-to-date academic program on the market. The most important features include:

- ◆ The development of practical case presented by experts in Lighting and Control Systems
- ◆ The graphic, schematic, and practical contents with which they are created provide scientific and practical information on the disciplines that are essential for professional development
- ◆ Practical exercises where the self-assessment process can be carried out to improve learning
- ◆ Special emphasis on innovative methodologies in Lighting and Control Systems
- ◆ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection work
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



*Do not miss the opportunity to take with us this Postgraduate Diploma in Lighting and Control Systems.  
It's the perfect opportunity to advance your career"*

“

*This Postgraduate Diploma is the best investment you can make when selecting a refresher program to update your knowledge in Lighting and Control Systems”*

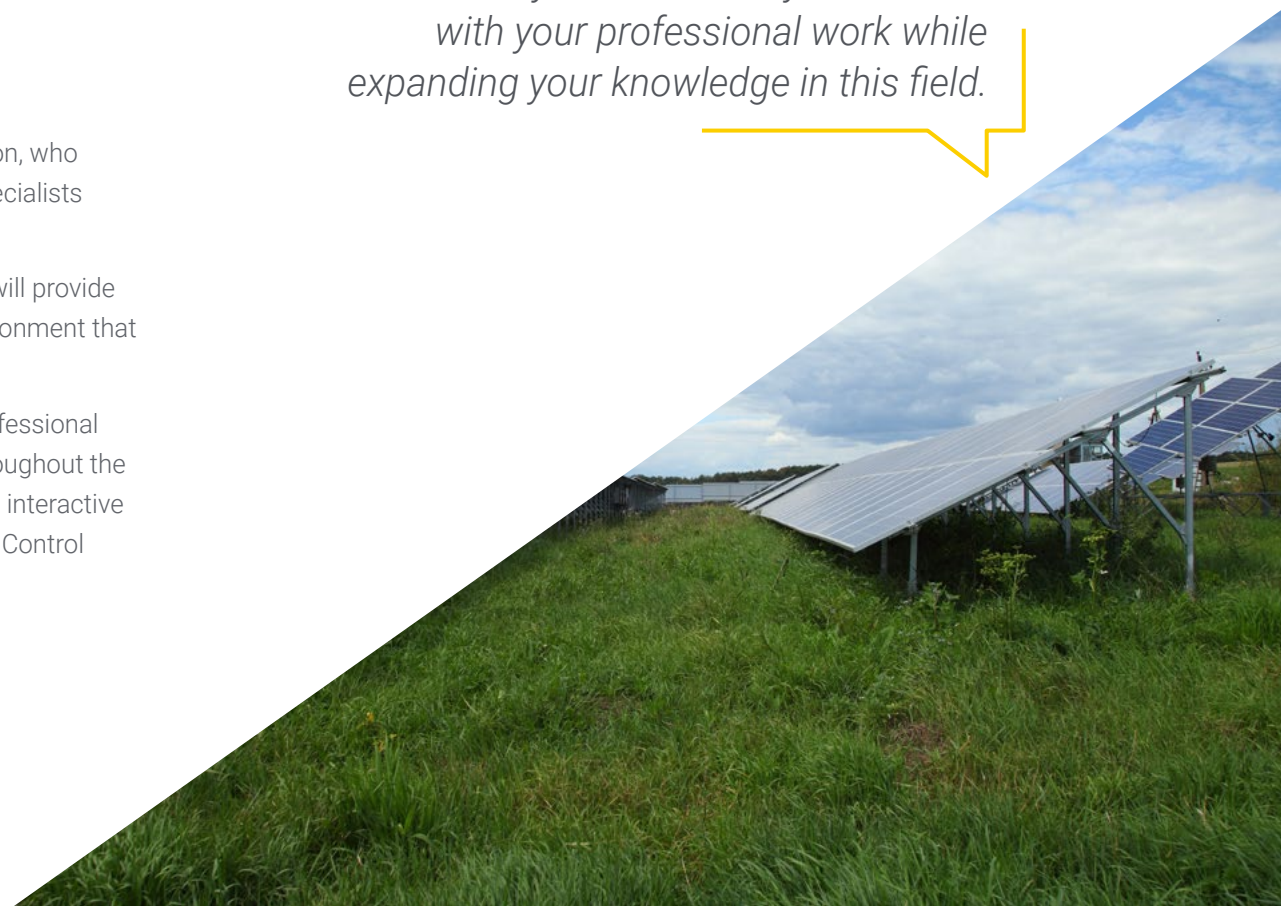
Its teaching staff includes professionals belonging to the field of construction, who bring to this program the experience of their work, as well as recognized specialists from leading companies and prestigious universities.

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 learning 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 throughout the program. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced experts in Lighting and Control Systems.

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

*This 100% online Postgraduate Diploma will allow you to balance your studies with your professional work while expanding your knowledge in this field.*



02

# Objectives

The Postgraduate Diploma in Lighting and Control Systems is designed to facilitate the performance of the professionals in this field to enable them to master the main developments in this area of Engineering.





“

*This is the best option to learn about the latest advances in Lighting and Control Systems"*



## General Objectives

---

- ◆ Understand the impact of a city's energy consumption and the major elements that make it function, the buildings
- ◆ Analyze energy consumption and demand in depth, as these are the key determinants of a building's energy comfort
- ◆ Prepare the students in the general knowledge of the different norms, standards, regulations and existing legislation, which will allow them to delve into the specific ones that act in the development of procedures for the actions in the field of energy-saving in buildings
- ◆ Delve into the importance of the architectural tools that will make it possible to make the best use of the climatic environment of a building
- ◆ Choose the most efficient equipment and detect deficiencies in the electrical installation to reduce consumption, optimize installations and establish a culture of energy efficiency in the organization
- ◆ In-depth breakdown of the properties of light involved in building energy savings
- ◆ Master and apply the techniques and requirements for the design and calculation of lighting systems, seeking to comply with health, visual and energy criteria
- ◆ Delve into and analyze the different control systems installed in buildings, the differences between them, the applicability criteria in each case and the energy savings provided





## Specific Objectives

---

### Module 1. Standards and Regulations

- ◆ Identify the responsible bodies and agencies
- ◆ Achieve a global vision of current regulations
- ◆ Justify the differences between the different documents, whether they are norms, regulations, standards, legislation and their scope of application
- ◆ Analyze in detail the main regulations for procedures on energy saving and sustainability in buildings
- ◆ Provide tools to search for related information

### Module 2. Lighting installations

- ◆ Apply the principles of lighting technology, its properties, differentiating the aspects that contribute to energy savings
- ◆ Analyze the criteria, characteristics and requirements of the different solutions that can be used in buildings
- ◆ Design and calculate lighting projects, improving energy efficiency
- ◆ Integrate health-enhancing lighting techniques as a benchmark in energy savings

### Module 3. Control Installations

- ◆ Analyze the different installations, technologies and control systems applied to energy saving in buildings
- ◆ Differentiate between the different systems to be implemented, distinguishing the characteristics in each specific case
- ◆ Delve into how control installations bring energy savings to buildings by optimizing energy resources
- ◆ Master the principles of configuration of control systems used in buildings



*Take the step to get up to date on the latest developments in Lighting and Control Systems”*

03

# Course Management

In our university we have professionals specialized in each area of study, who pour their expertise into our specialization courses.



“

*Our university employs the best professionals in all areas who share their knowledge to help you"*

## Management



### Mr. Nieto-Sandoval González- Nicolás, David

- Industrial Technical Engineer by the E.U.P. of Málaga.
- Industrial Engineer from E.T.S.I.I.
- Master's Degree in Integral Management of Quality, Environment and Health and Safety at Work from the University of the Balearic Islands
- He has been working for more than 11 years, both for companies and independently, for clients in the private agri-food industrial sector and the institutional sector, as a consultant in engineering, project manager, energy saving and circularity in organizations
- Professor certified by the EOI in the areas of industry, entrepreneurship, human resources, energy, new technologies and technological innovation
- Trainer for the European INDUCE project
- Trainer at institutions such as COGITI or COIIM

## Professors

### Ms. Peña Serrano, Ana Belén

- ♦ Technical Engineer in Topography from the Polytechnic University of Madrid
- ♦ Master's Degree in Renewable Energies from San Pablo CEU University
- ♦ Postgraduate Certificate in Geological Cartography from Universidad Nacional de Educación a Distancia (National University of Distance Education)
- ♦ Postgraduate Certificate in Building Energy Certification from Fundación Laboral de la Construcción
- ♦ Her experience covers several sectors from working on site, to managing people in human resources

- ♦ She collaborates in different scientific communication projects, directing the dissemination in different media in the field of energy
- ♦ Member of the work management team for the Master's Degree in Environmental and Energy Management in Organizations at the International University of La Rioja

### Mr. González Cano, José Luis

- ♦ Degree in Optics and Optometry from the Complutense University of Madrid
- ♦ Lighting Designer He collaborates with companies in the lighting sector in consulting, training, lighting technology projects and implementation of ISO 9001:2015 quality systems (internal auditor)



- ◆ He is a teacher for Vocational Training in electronic systems, telematics (CISCO certified instructor), radio communications, IoT
- ◆ Member of the Professional Association of Lighting Designers (Technical Consultant) and member of the Spanish Lighting Committee, who participates in working groups on LED technology

“

*Train in the world's leading private online university"*

04

# Structure and Content

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





“

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

## Module 1. Standards and Regulations

- 1.1. Regulation
  - 1.1.1. Justification
  - 1.1.2. Key Notes
  - 1.1.3. Responsible Agencies and Authorities
- 1.2. National and International Standards
  - 1.2.1. ISO Standards
  - 1.2.2. EN Standards
  - 1.2.3. UNE Standards
- 1.3. Building Construction Sustainability Certificates
  - 1.3.1. The Need for Certificates
  - 1.3.2. Certification Procedures
  - 1.3.3. BREEAM, LEED, Green and WELL
  - 1.3.4. PassiveHaus
- 1.4. Standards
  - 1.4.1. Industry Foundation Classes (IFC)
  - 1.4.2. Building Information Model (BIM)
- 1.5. European Directives
  - 1.5.1. Directive 2002/ 91
  - 1.5.2. Directive 2010/ 31
  - 1.5.3. Directive 2012/ 27
  - 1.5.4. Directive 2018/ 844
- 1.6. Technical Building Code (CTE)
  - 1.6.1. Applying CTE
  - 1.6.2. CTE Basic Documents
  - 1.6.3. CTE Support Documents
  - 1.6.4. Accepted Documents
- 1.7. Building Energy Certification Procedure
  - 1.7.1. R.D. 235/2013
  - 1.7.2. Technical Conditions
  - 1.7.3. Energy Efficiency Label

- 1.8. Regulation of Thermal Installations in Buildings (RITE)
  - 1.8.1. Objectives
  - 1.8.2. Administration Conditions
  - 1.8.3. Execution Conditions
  - 1.8.4. Maintenance and Inspections
  - 1.8.5. Technical Guides
- 1.9. Low Voltage Electrotechnical Regulations (REBT)
  - 1.9.1. Key Application Aspects
  - 1.9.2. Internal Installations
  - 1.9.3. Installations in Publicly Concurred Premises
  - 1.9.4. External Installations
  - 1.9.5. Domotic Installations
- 1.10. Related Standards. Search Engines
  - 1.10.1. Government Agencies
  - 1.10.2. Business Entities and Associations

## Module 2. Lighting installations

- 2.1. Light Sources
  - 2.1.1. Lighting Technology
    - 2.1.1.1. Properties of Light
    - 2.1.1.2. Photometry
    - 2.1.1.3. Photometric Measurements
    - 2.1.1.4. Luminaires
    - 2.1.1.5. Auxiliary Electrical Equipment
  - 2.1.2. Traditional Light Sources
    - 2.1.2.1. Incandescent and Halogen
    - 2.1.2.2. High- and Low-Pressure Sodium Vapor
    - 2.1.2.3. High- and Low-Pressure Mercury Steam
    - 2.1.2.4. Other Technologies: Induction, Xenon
- 2.2. LED Technology
  - 2.2.1. Principle of Operation
  - 2.2.2. Electrical Characteristics

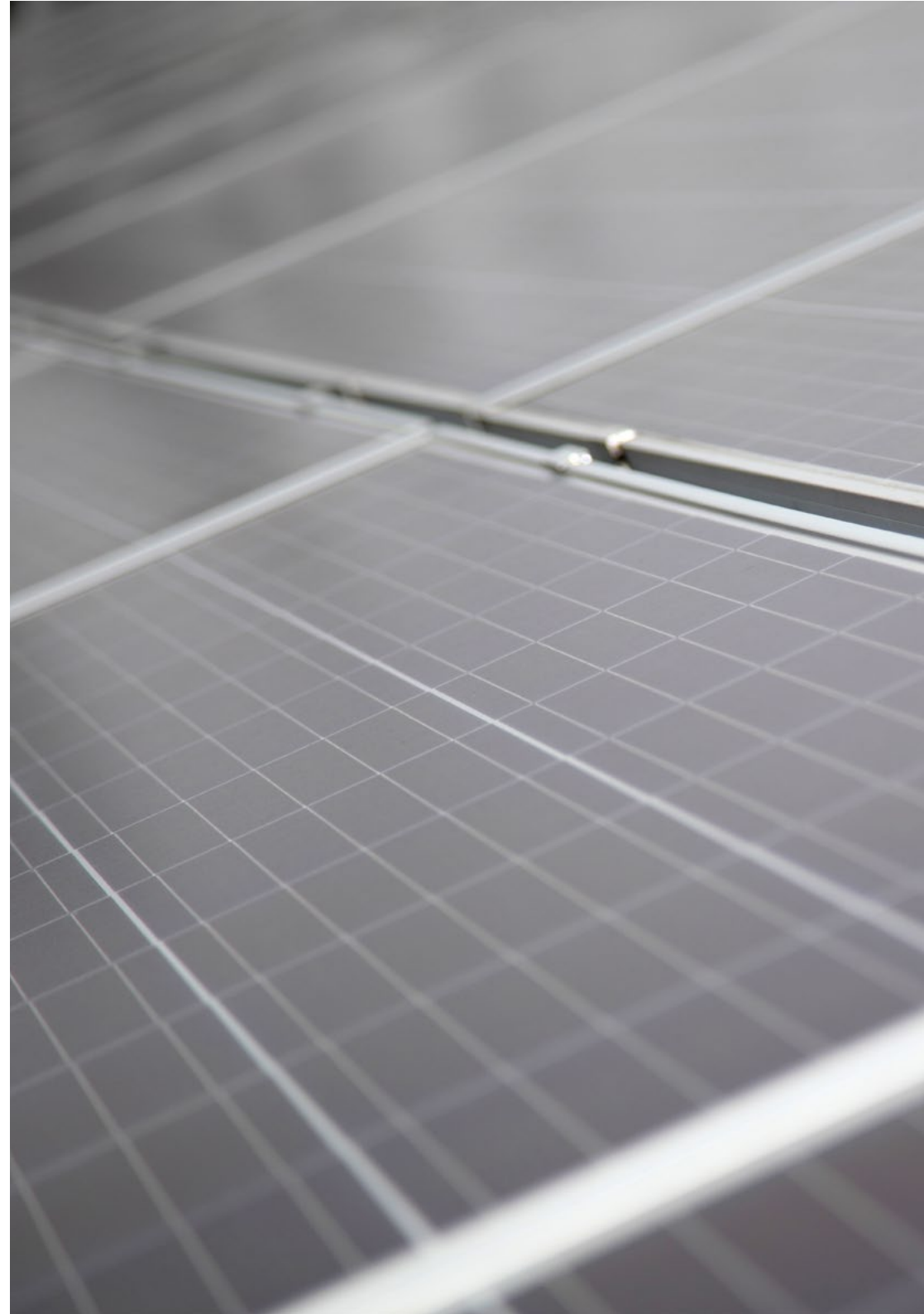


- 2.2.3. Advantages and Disadvantages
- 2.2.4. LED Luminaires. Optical
- 2.2.5. Auxiliary Equipment. *Driver*
- 2.3. Interior Lighting Requirements
  - 2.3.1. Standards and Regulations
  - 2.3.2. Lighting Project
  - 2.3.3. Quality Criteria
- 2.4. Outdoor Lighting Requirements
  - 2.4.1. Standards and Regulations
  - 2.4.2. Lighting Project
  - 2.4.3. Quality Criteria
- 2.5. Lighting Calculations with Calculation Software. DIALux
  - 2.5.1. Features
  - 2.5.2. Menus
  - 2.5.3. Project Design
  - 2.5.4. Obtaining and Interpreting Results
- 2.6. Lighting Calculations with Calculation Software. EVO
  - 2.6.1. Features
  - 2.6.2. Advantages and Disadvantages
  - 2.6.3. Menus
  - 2.6.4. Project Design
  - 2.6.5. Obtaining and Interpreting Results
- 2.7. Energy Efficiency in Lighting
  - 2.7.1. Standards and Regulations
  - 2.7.2. Energy Efficiency Improvement Measures
  - 2.7.3. Integration of Natural Light
- 2.8. Biodynamic Lighting
  - 2.8.1. Light Pollution
  - 2.8.2. Circadian Rhythms
  - 2.8.3. Harmful Effects
- 2.9. Calculation of Interior Lighting Projects
  - 2.9.1. Residential Buildings
  - 2.9.2. Business Buildings
  - 2.9.3. Educational Centers

- 2.9.4. Hospitals
- 2.9.5. Public Buildings
- 2.9.6. Industries
- 2.9.7. Commercial and Exhibition Spaces
- 2.10. Calculation of Outdoor Lighting Projects
  - 2.10.1. Street and Road Lighting
  - 2.10.2. Facades
  - 2.10.3. Signs and Illuminated Signs

### Module 3. Control Installations

- 3.1. Home Automation
  - 3.1.1. State-of-the-Art
  - 3.1.2. Standards and Regulations
  - 3.1.3. Equipment
  - 3.1.4. Services
  - 3.1.5. Networks
- 3.2. Inmotics
  - 3.2.1. Characteristics and Regulations
  - 3.2.2. Building Automation and Control Technologies and Systems
  - 3.2.3. Technical Building Management for Energy Efficiency
- 3.3. Telemanagement
  - 3.3.1. System Determination
  - 3.3.2. Key Elements
  - 3.3.3. Monitoring Software
- 3.4. *Smart Home*
  - 3.4.1. Features
  - 3.4.2. Equipment
- 3.5. The Internet of Things IoT
  - 3.5.1. Technological Monitoring
  - 3.5.2. Standards
  - 3.5.3. Equipment
  - 3.5.4. Services
  - 3.5.5. Networks
- 3.6. Telecommunications Installations



- 3.6.1. Key Infrastructure
- 3.6.2. Television
- 3.6.3. Radio
- 3.6.4. Telephony
- 3.7. KNX, DALI Protocols
  - 3.7.1. Standardization
  - 3.7.2. Applications
  - 3.7.3. Equipment
  - 3.7.4. Design and Configuration
- 3.8. IP Networks WiFi
  - 3.8.1. Standards
  - 3.8.2. Features
  - 3.8.3. Design and Configuration
- 3.9. Bluetooth
  - 3.9.1. Standards
  - 3.9.2. Design and Configuration
  - 3.9.3. Features
- 3.10. Future Technologies
  - 3.10.1. Zigbee
  - 3.10.2. Programming and Configuration. Python
  - 3.10.3. Big Data



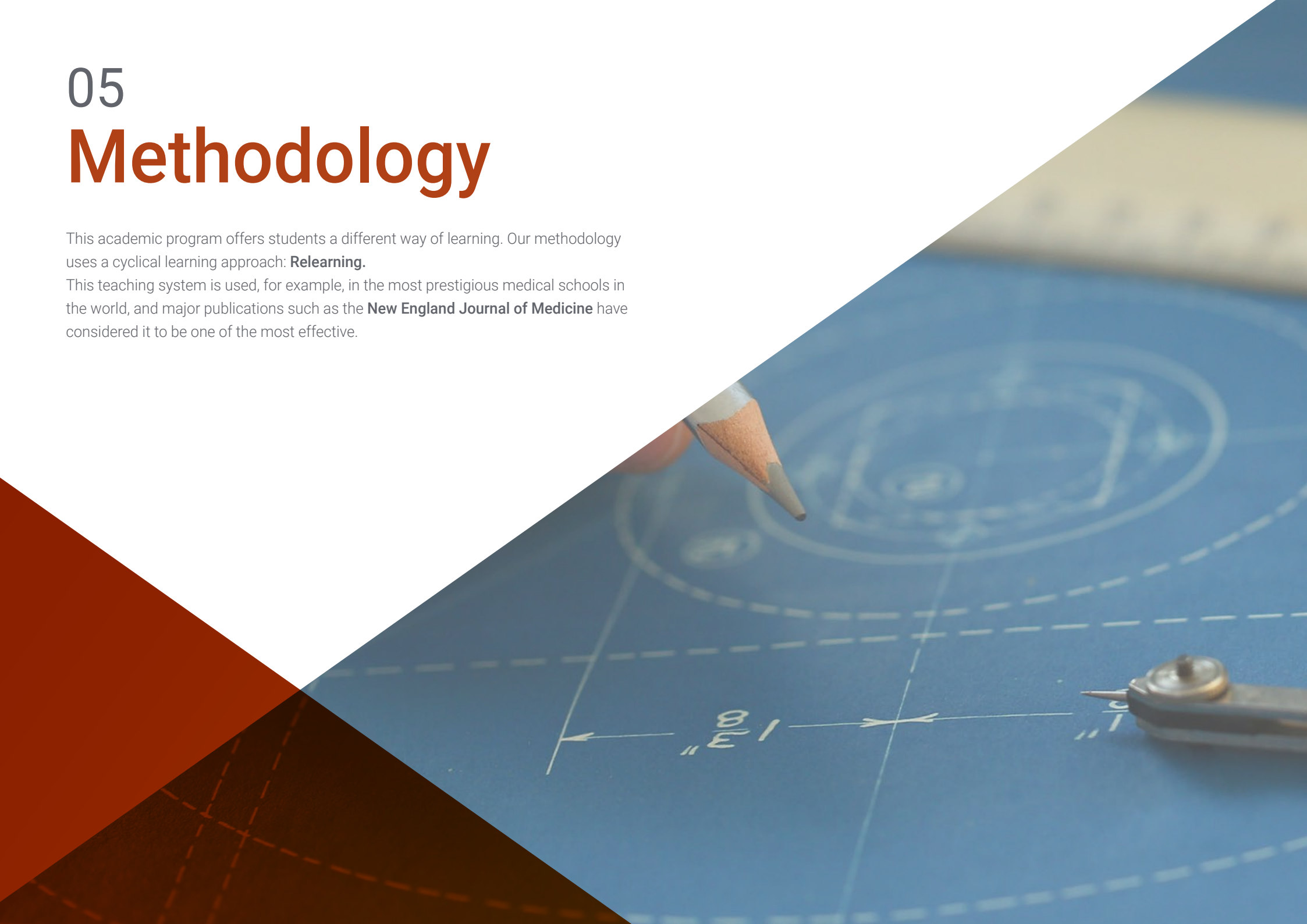
*This program will allow you  
to advance in your career  
comfortably"*

# 05

# 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 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.



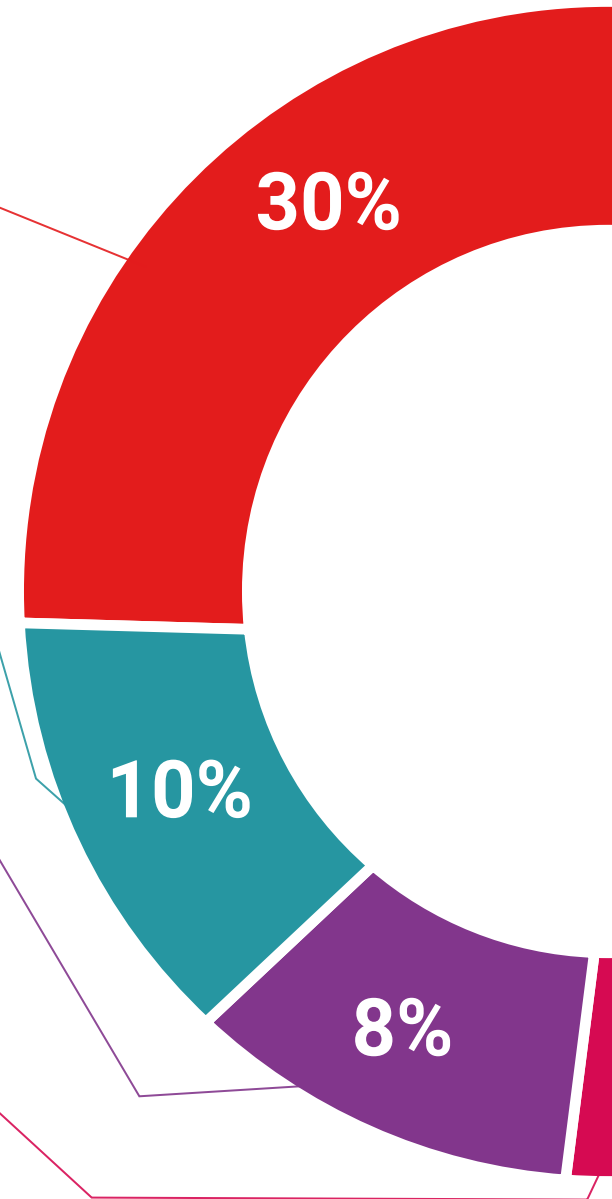
### Practising Skills and Abilities

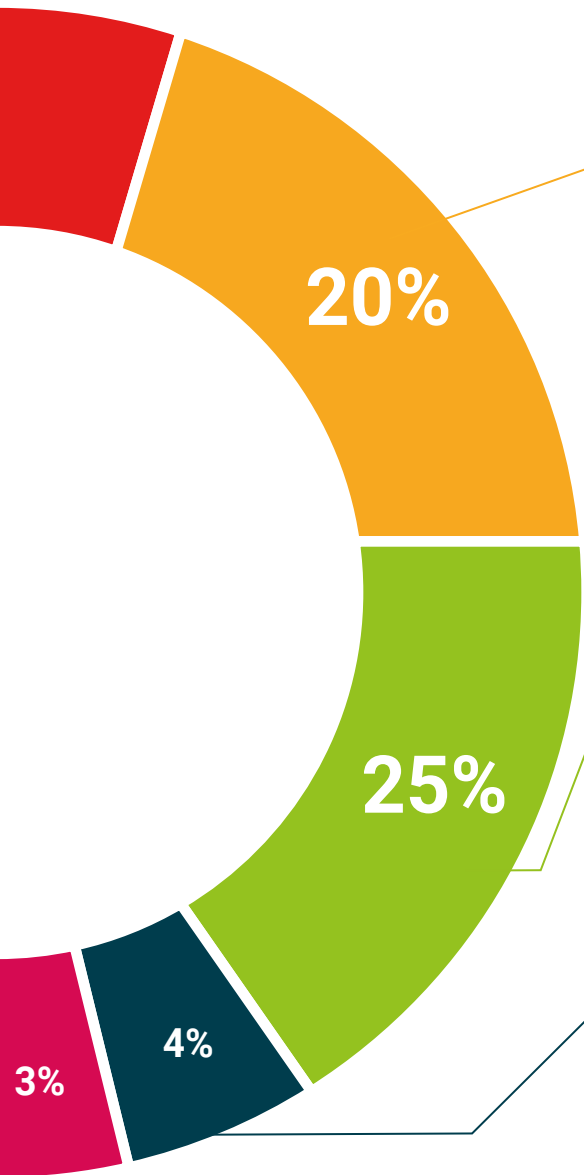
They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



### 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.



06

# Certificate

The Postgraduate Diploma in Lighting and Control Systems guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma 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 Diploma in Lighting and Control Systems** 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 Diploma**, issued by **TECH Technological University** via tracked delivery\*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Diploma, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Diploma in Lighting and Control Systems**

Official N° of Hours: **450 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

**tech** technological  
university

## Postgraduate Diploma Lighting and Control Systems

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

# Postgraduate Diploma Lighting and Control Systems

