Postgraduate Diploma
Resilience of Cities through Urban Ecosystem Services

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Postgraduate Diploma
Resilience of Cities through Urban Ecosystem Services

- » Modality: **online**
- » Duration: **6 months**
- » Certificate: **TECH Global University**
- » Credits: **18 ECTS**
- » Schedule: **at your own pace**
- » Exams: **online**

Website: **www.techtitute.com/us/engineering/postgraduate-diploma/postgraduate-diploma-resilience-cities-urban-ecosystem-services**

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01
Introduction

Given the inevitability of climate and population changes in the cities of the 21st century, a resilient vision of cities is gaining more strength and relevance, turning them into spaces where they connect with nature in a sustainable way. This is the first step of a necessary engine of change for the future of societies, so it is necessary that engineers and architects specialize in issues such as ecosystem services, green infrastructure or functional and ecological connectivity. This program brings together a large team of experts to give engineers the opportunity to stand out and take the lead in the urban planning of the future, with a 100% online learning methodology.

Do not miss the opportunity to join the most important urban change of the last decades, deepening properly in Urban Ecosystem Services"

The cities of the future are destined to be sustainable urban spaces, with a detailed focus on issues such as energy efficiency, resilient green infrastructures or agro-ecosystems linked to sustainability. These are areas of specialization in constant adaptation and evolution, as urban challenges and proposals progress at the same pace as technological and ideological advances in society.

Therefore, a situation has arisen in which architects and engineers specialized in the Resilience of Cities through Urban Ecosystem Services will be the best positioned to take on large-scale urban projects. This justifies the creation of this Postgraduate Diploma, which compiles both the practical tools and the most relevant architectural postulates in urban planning. Upon graduation, students will be able to distinguish themselves as advanced specialists in the field of planning environmentally friendly cities and towns.

The nature of the program also greatly favors its flexibility, dispensing with on-site classes and fixed schedules. On the contrary, it is the students themselves who have the ability to decide when, where and how to take on the entire course load. To this end, all content is available in 100% online format and can be accessed from any device with an Internet connection.

This **Postgraduate Diploma in Resilience of Cities through Urban Ecosystem Services** contains the most complete and up-to-date educational program on the market. The most important features include:

- The development of case studies presented by experts in Design of Sustainable Green Infrastructures
- 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 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

Access the entire syllabus from the comfort of your smartphone, tablet or computer of choice"

"*Analyzes in detail the economics of ecosystems and sustainable urban planning, taking into account social, urban and financial aspects"*

Distribute the teaching load as it best suits you at all times, having flexibility and absolute freedom to adapt it to your own pace.

You will have a privileged contextualization of each topic covered through practical analysis of green infrastructure design and planning.

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 professionals 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 professionals must try to solve the different professional practice situations that are presented throughout the academic course. For this purpose, the students will be assisted by an innovative interactive video system created by renowned experts.

02
Objectives

Taking into consideration the future relevance of Urban Ecosystem Services in the planning and development of cities, TECH offers in this Postgraduate Diploma a vision of both current and future challenges and the most effective tools to face them, preparing the engineers for all types of scenarios and situations that they may face when leading complex urban planning and management projects.

Incorporate into your methodological arsenal the most advanced urban evaluation and assessment tools"

General Objectives

- Provide a rationale for the current context of sustainable urban development
- Analyze the main global reference strategies for Sustainable Urban Development
- Protecting and promoting Urban Biodiversity
- Communicate through visualization of good environmental management
- Analyze different nature-based solutions as city transformers

Bring inestimable value to any urban planning project with a resilient, modern and ecological vision of urban spaces"

Specific Objectives

Module 1. Infrastructure to improve the livability of cities

- Examine the ecosystem services that green infrastructure offers us
- Develop methodologies for analyzing the impact of green infrastructure on people's quality of life
- Analyze new techniques to promote the development of green infrastructure
- Generate opportunities for the participation of stakeholders in the management of green infrastructure and in the enjoyment of its ecosystem services
- Analyze the ESSES offered by the IVU in cities
- Evaluate the economic and social impact of the benefits of UVI on the health and quality of life of citizens
- Develop the therapeutic benefits of IVs as health recuperators
- Identify the actors involved in the management and promotion of IV to achieve holistic management of their EHCS
- Analyze how to involve citizens by managing stakeholders' expectations
- Discover success stories and innovative experiences in the field of IVU management

Module 2. Infrastructures for urban resilience

- Develop the concepts of urban resilience to climate change and analyze adaptation and mitigation needs and the difference between the two
- Analyze the elements of green infrastructure that are directly or indirectly related to urban adaptation to change
- Assess the direct relationship between exposure to nature and public, physical, and mental health
- Recognize the elements of green infrastructure present in our immediate environment in the city

- Identify the items of contribution to energy efficiency of green infrastructure elements
- Evaluate the implication of green infrastructure on the health and well-being of the inhabitants of the urban environment. Socialization and empowerment of the sense of belonging
- Evaluate the projection of current green infrastructure actions for future cities

Module 3. Measuring, quantifying, valuing and mapping ecosystem services

- Analyze the rationale for measuring Ecosystem Services
- Identify ecosystem services assessment tools
- Examine ecosystem services measurement and valuation models
- Establish the products and needs for each tool
- Determine the set of ecosystem services that can be assessed by each tool
- Carry out a comparison of ESS assessment tools with the standard criteria
- Delve into the management of *i-Tree*
- Size the projects according to the particularity of the ecosystem services and the type of infrastructure to be quantified
- Evaluate the gaps and opportunities for improving the quality of EESS based on the data obtained
- Propose governance for ecosystem-based adaptation

03
Course Management

The entire faculty that makes up this Postgraduate Diploma has an outstanding track record in the planning and management of urban spaces of all kinds. Specialists in the private and public urban area have combined both the most important architectural theory and their own particular vision and formula for success, determining the appropriate keys for the engineer to be able to lead and be part of ambitious urban projects.

You will gain an experienced vision of the Resilience of Cities through Urban Ecosystem Services"

Management

Mr. Rodríguez Gamo, José Luis

- Business Development Director at Green Urban Data
- Senior sustainability consultant for large companies and public administrations
- Manager of the Urban and Environmental Services Division of Grupo Ferrovial
- Manager of Climate Change and Biodiversity of Grupo Ferrovial
- Forestry Engineer from the Polytechnic University of Madrid
- Specialization in Silvopastoral Farming
- Postgraduate degree in Conservation and Maintenance of Urban Green Zones from the Polytechnic University of Madrid
- Executive Management Program by the Instituto de Empresa

Professors

Ms. Agúndez Reigosa, Marina

- Consulting Development Director at Green Urban Data
- External Consultant in Green Infrastructure, Ecosystem Services and Process Improvement
- Coordinator of Operational Efficiency Projects at Grupo Ferrovial
- Production Manager in Gardening and Forestry Services at Grupo Ferrovial
- Forestry Engineer from the Polytechnic University of Madrid
- Specialization in Silvopastoral Farming
- Specialization Course in Rehabilitation of Historic Gardens and Parks, Natural Resources and Conservation

Mr. Martínez Gaitán, Óscar

- Agricultural Engineer in Los Árboles Mágicos
- Postgraduate Diploma in Agroecosystems and Urban Ecosystems at IUCN
- Agronomical Advisor at CHM Infraestructuras
- Integrated Pest Management Advisor at Parque Deportivo La Garza
- Agriculture Engineer from the University of Almería
- Specialization in Engineering, Design and Maintenance of Golf Courses and Golf Engineering at the University Miguel Hernandez
- Degree in SME Management and Business Economics from the School of Industrial Organization

04
Structure and Content

TECH develops all its programs following the *Relearning* pedagogical methodology, which fosters a critical spirit in the students themselves in order to enhance their own transversal competences. In this way, the teaching is not linear, but the key concepts and materials in Resilience of Cities through Urban Ecosystem Services are given gradually and reiterated throughout the program. This saves considerable study hours, making the academic experience much more enjoyable and comprehensive.

"Detailed videos, interactive summaries and a multimedia library of the highest quality await you in the Virtual Campus of this Postgraduate Diploma"

Module 1. Infrastructure to improve the livability of cities

1.1. Ecosystem Services of Green Infrastructure
    1.1.1. Regulatory Services
    1.1.2. Cultural Services
    1.1.3. Green Infrastructure Management based on Ecosystem Services
1.2. Green Infrastructure and Quality of Life in Cities
    1.2.1. Decarbonization of cities and health promotion through healthy mobility
    1.2.2. Mitigation of socioeconomic differences
    1.2.3. Transversal programs of municipal management and promotion of healthy living habits among citizens
1.3. Biodiversity. Effects on Health
    1.3.1. Resilient Cities through Biodiversity
    1.3.2. Biodiversity as a disservice minimizer
    1.3.3. Urban Green Infrastructures (IVU) indispensable eco-connector
1.4. Sustainable Drainage System. Sealing
    1.4.1. Soil and water management and their adaptation to meteorological phenomena.
    1.4.2. Soil drainage improvement techniques and processes
    1.4.3. Soil management success stories
1.5. Façades and green roofs to naturalize the city.
    1.5.1. Eco-connectivity in facades and roofs
    1.5.2. Management and conservation of green facades and roofs
    1.5.3. Valorization of the SSEE of green facades and roofs
1.6. Living tree surrounds and industrial areas
    1.6.1. Living flowerbeds. Design and Conservation
    1.6.2. Observatory of Nature-Based Solutions (NBS) in industrial areas.
    1.6.3. Results and success stories
1.7. Landscape and Sense of belonging
    1.7.1. Landscape ecology
    1.7.2. Landscape in the urban forest and landscaped spaces.
    1.7.3. Bioengineering solutions in the creation of the landscape and the integration of mobility infrastructures.

1.8. Landscape restoration and biodiversity. Case Study
    1.8.1. Current and optimal status
    1.8.2. Definition of objectives and proposed solutions
    1.8.3. Planning and involvement of agents as pillars of success
1.9. Involvement of agents for holistic management
    1.9.1. Coordination between public administrations
    1.9.2. Education and Citizen Participation in Green Infrastructure (IV)
    1.9.3. Successful cases in cross-cutting management
1.10. Green infrastructure and health
    1.10.1. Green Infrastructure (IV) as a therapeutic element
    1.10.2. The green prescription. Health Promotion and Recovery through Green Infrastructure (IV)
    1.10.3. Green Infrastructure (IV) and its impact on the health system

Module 2. Infrastructures for urban resilience

2.1. The Heat Island Phenomenon. Effects and Consequences
    2.1.1. The Heat Island Phenomenon
    2.1.2. The city and the heat island phenomenon
    2.1.3. Adaptation to changes
2.2. Energy Efficiency of Urban Green Infrastructure
    2.2.1. Heat reduction
    2.2.2. Landscaped facades
    2.2.3. Green roofs
    2.2.4. Biological cooling
    2.2.5. Biophilic buildings
2.3. Functional and ecological connectivity and proximity spaces
    2.3.1. Opportunity spaces
    2.3.2. Alignment trees
    2.3.3. Small squares
    2.3.4. Urban parks
    2.3.5. Large periurban parks
    2.3.6. Ecological corridors and connectivity

Module 3. Measuring, quantifying, valuing and mapping ecosystem services

3.3. TESSA for assessing ecosystem services at the scale of an area.

3.3.1. Coastal protection

3.3.2. Cultivated assets

3.3.3. Cultural Services

3.3.4. Global climate regulation

3.3.5. Harvested wild goods

3.3.6. Nature-based recreation

3.3.7. Pollination

3.3.8. Water. Provision, quality and flood control

3.4. SolVES (*Social Values for Ecosystem Services*) as a tool for mapping ecosystem services

3.4.1. Assessing, mapping and quantifying the perceived social values of ecosystem services

3.4.2. Integration into GIS

3.4.3. Open source developed for QGIS

3.5. ARIES (*Artificial Intelligence for Ecosystem Sevices* s). Artificial Intelligence applied to Geographic Information Systems (GIS) for Ecosystem Services

3.5.1. Spatial data and GIS for visualizing input and output maps

3.5.2. Equations and lookup tables

3.5.3. Probabilistic Models

3.5.4. Process-Based Models

3.5.5. Agent-based models, which represent ecological and social agents in a dynamic and interdependent way

3.6. *i-Tree Suite* of software tools for the assessment, diagnosis and inventory of the urban forest and its ESSs

3.6.1. *i-Tree Canopy*

3.6.2. *i-Tree* ECO

3.6.3. *i-Tree My tree*

3.6.4. *i-Tree Landscape*

3.6.5. *i-Tree Design*

3.7. Modeling using *i-Tree Canopy* applied to the diagnosis of the Green Infrastructure

3.7.1. Monte Carlo Method

3.7.2. Study sizing

3.7.3. Identification of the studied spaces

3.7.4. Pollutants absorbed

3.7.5. Carbon sink

3.7.6. Runoff avoided

3.8. Modeling using *i-Tree* Eco applied to urban forest inventory and management

3.8.1. Study sizing

3.8.2. Complete inventories

3.8.3. Inventories by parcels

3.8.4. Field data collection

3.8.5. Ecosystem study

3.8.6. Valuation of Ecosystem Services (SSEE)

3.8.7. Future projection

3.9. Green Infrastructure management based on the results obtained through the quantification of Ecosystem Services (SSEE)

3.9.1. Ecosystem-based governance

3.9.2. Green infrastructure strategy development

3.9.3. Modeling of Payment for Ecosystem Services (PES) policies

3.10. GIS Systems and Cartography applied to Ecosystem Services (ESS)

3.10.1. Functioning of a GIS

3.10.2. Techniques used in geographic information systems

3.10.3. Data creation

3.10.4. Data Representation

3.10.4.1. Raster

3.10.4.2. Vectorial

3.10.5. Raster and vector models

3.10.6. Non-spatial data
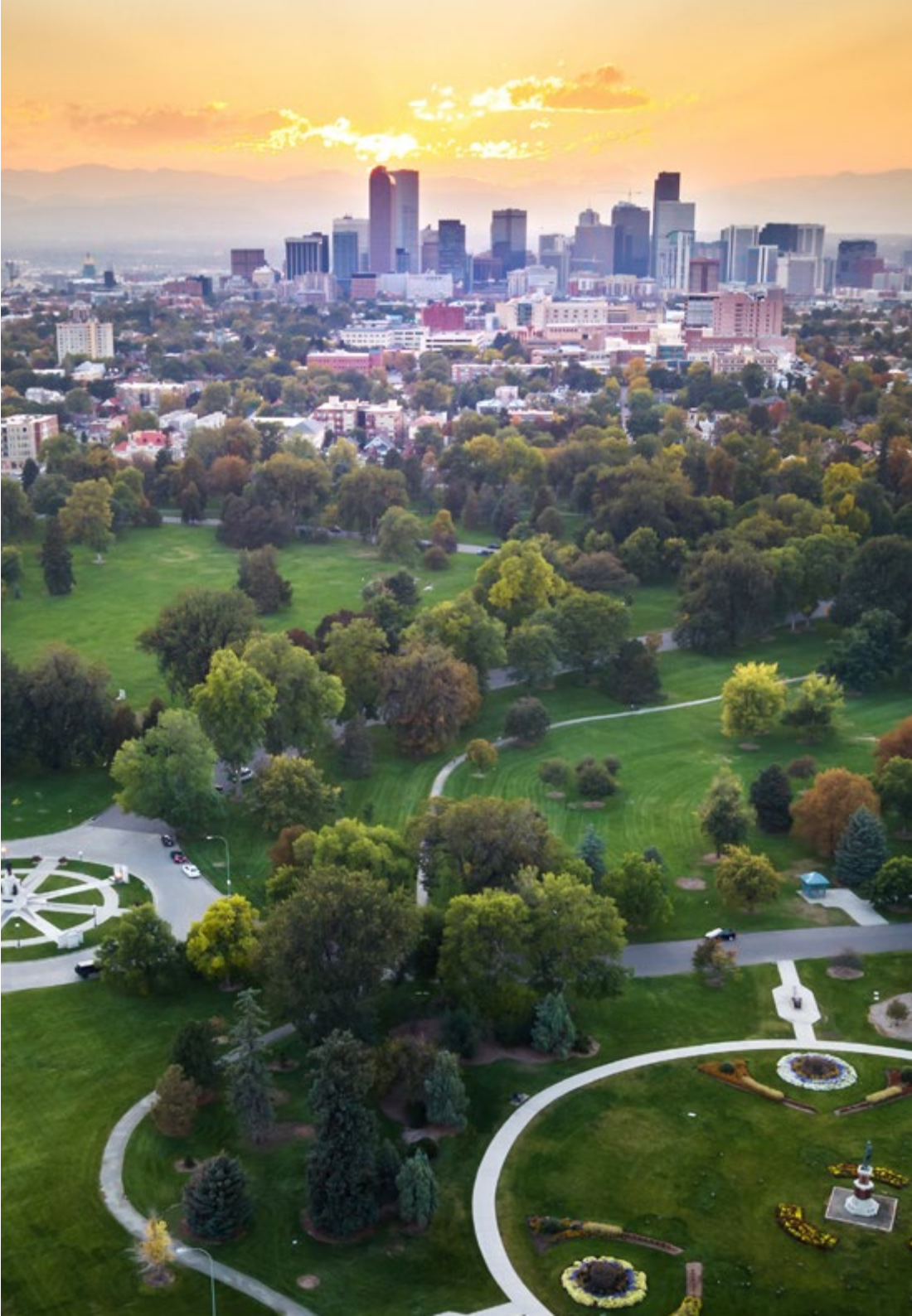
3.10.7. Data capture

Get a decisive reference guide in the urban planning field, with the guidelines and working methodologies with which the cities of the future will be built"

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.
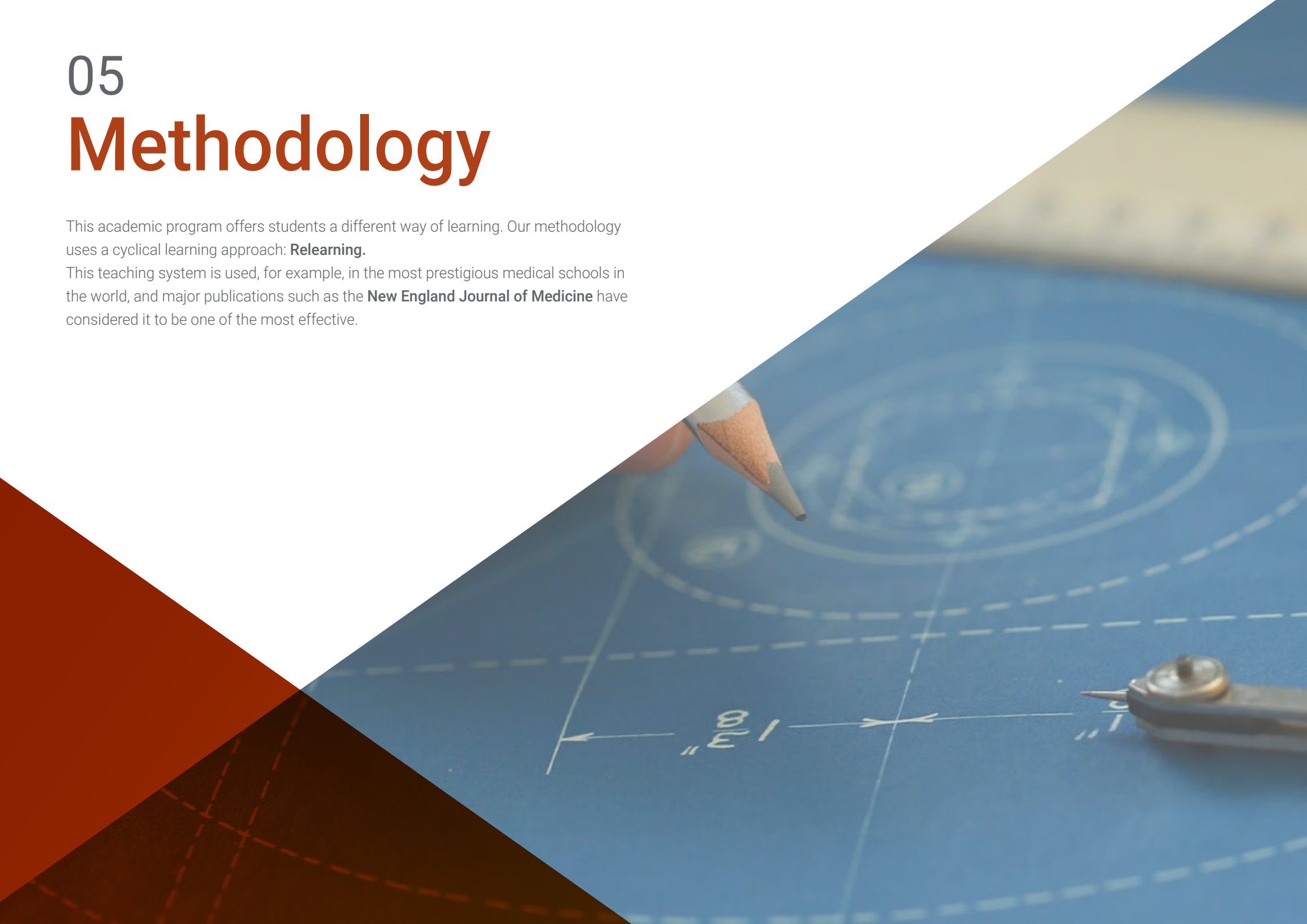
Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

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.

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.

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

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.

01 learning from evidence

02 relearning from evidence

03 testing

04 learning from an expert

05 neurocognitive context dependent learning

06 Von-Restorff effect

07 case based learning through storytelling

08 competencies testing (retesting)

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.

30%

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.

10%

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.

8%

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.

20%

25%

4%

3%

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 Resilience of Cities through Urban Ecosystem Services guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Global University.

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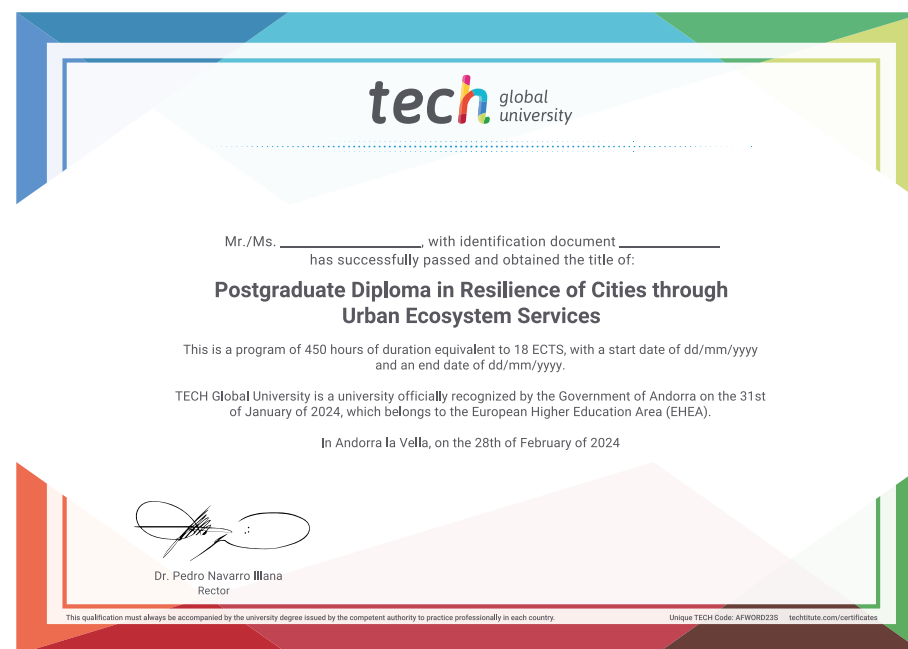
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Diploma in Resilience of Cities through Urban Ecosystem Services**

Modality: **online**

Duration: **6 months**

Accreditation: **18 ECTS**

tech global university

Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Postgraduate Diploma in Resilience of Cities through Urban Ecosystem Services

This is a program of 450 hours of duration equivalent to 18 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Rector

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country.   Unique TECH Code: AFWORD23S   techtitute.com/certificates

*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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