Postgraduate Certificate
Parametric Design and Digital Manufacturing

tech global university

Postgraduate Certificate
Parametric Design and Digital Manufacturing

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

Website: **www.techtitute.com/us/artificial-intelligence/postgraduate-certificate/parametric-design-digital-manufacturing**

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01
Introduction

In a business environment where sustainability and efficiency are increasingly relevant, Parametric Design and Digital Fabrication have become essential tools for experts. These technologies not only allow experimenting with innovative structures, but also facilitate the customization and adaptation of spaces to users' needs. In addition, the adoption of these methodologies promotes more sustainable and efficient practices in the field of construction. Therefore, it is essential that professionals handle these tools to significantly reduce material waste and improve the energy efficiency of buildings. To help them with this task, TECH launches a pioneering online university program focused on Parametric Design and Digital Fabrication.

Through this 100% online Postgraduate Certificate, you will master Digital Fabrication technologies such as KUKA PRC to improve accuracy in the construction of architectural components"

The integration of advanced technologies such as Parametric Design and Digital Fabrication is transforming architectural practice. A recent World Economic Forum report reflects that the use of these tools can reduce material consumption by 30%, improving economic efficiency and reducing the ecological footprint of architectural projects. Given these benefits, architects need to incorporate these methodologies into their daily practice to create more sustainable and functional environments.

In this context, TECH presents a cutting-edge Postgraduate Certificate in Parametric Design and Digital Fabrication. Conceived by references in this field, the academic itinerary will delve into issues ranging from the use of Grasshopper or algorithmic optimization with Generative Design to robotics in construction with KUKA PRC. The curriculum will also delve into the use of Autodesk Fusion 360 to design adaptive architectural systems and mass customization. The course materials will also analyze the most innovative topological optimization techniques to improve the sustainability of architectural projects. In this way, graduates will develop advanced competencies to use Parametric Design software to create flexible and adaptive architectural models that respond to diverse requirements.

On the other hand, the program's methodology is based on the revolutionary Relearning system powered by TECH, which guarantees the exhaustive assimilation of complex concepts. In this sense, the only thing architects need to access the Virtual Campus is an electronic device with Internet access (such as a cell phone, tablet or computer). Therefore, students will be able to enjoy dissimilar multimedia resources such as explanatory videos, specialized readings or interactive summaries. Undoubtedly, a high intensity experience that will allow graduates to experience a significant leap in quality in their professional careers as architects.

This **Postgraduate Certificate in Parametric Design and Digital Manufacturing** contains the most complete and up-to-date program on the market. The most important features include:

- Development of practical cases presented by experts in Artificial Intelligence
- 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

A curriculum designed to enhance your skills in Parametric Design and Digital Manufacturing, maximizing your potential in the field of architecture"

Want to design adaptive systems using Autodesk Fusion 360 and Artificial Intelligence to perform mass customization? Get it with this university program"
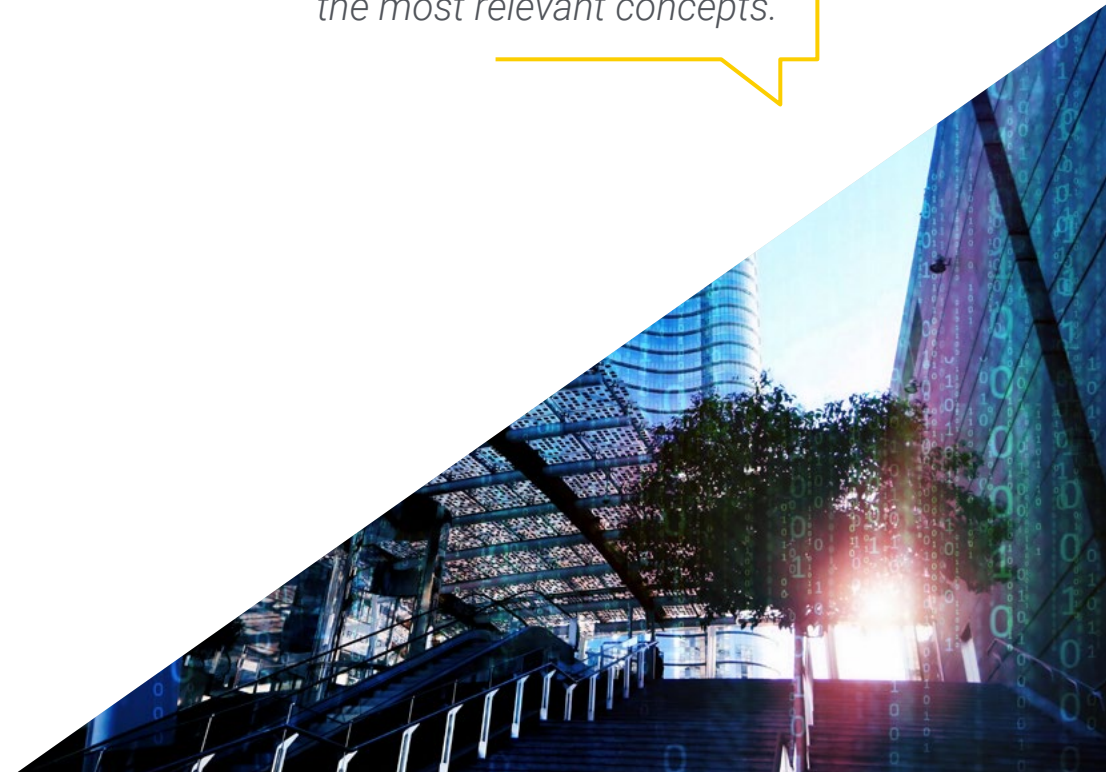
You will delve into the integration of Artificial Intelligence to optimize the use of architectural materials significantly.

With TECH's Relearning system you will not have to invest a large amount of study hours and you will focus on the most relevant concepts.

The program's teaching staff includes professionals from the field who contribute their work experience to this educational program, as well as renowned 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 course. For this purpose, students will be assisted by an innovative interactive video system created by renowned experts in the field of educational coaching with extensive experience.

Objectives

Through this Postgraduate Certificate, experts will handle the use of Parametric Design software (among which Grasshopper Autodesk Fusion 360 stands out) to create flexible and adaptive architectural models that respond to different conditions. In line with this, professionals will use simulations in their designs to improve aspects such as energy efficiency, structure or sustainability of buildings. At the same time, graduates will implement Digital Manufacturing and robotics technologies such as KUKA PCR to improve both accuracy and efficiency in the construction of architectural elements.

"You will acquire advanced skills to carry out simulations that optimize the sustainability of buildings and facilitate informed decision-making in architectural design"

General Objectives

- Understand the theoretical foundations of Artificial Intelligence
- Study the different types of data and understand the data lifecycle
- Evaluate the crucial role of data in the development and implementation of AI solutions
- Delve into algorithms and complexity to solve specific problems
- Explore the theoretical basis of neural networks for Deep Learning development
- Explore bio-inspired computing and its relevance in the development of intelligent systems
- Manage advanced Artificial Intelligence tools to optimize architectural processes such as parametric design
- Apply Generative Modeling techniques to maximize efficiency in infrastructure planning and improve the energy performance of buildings
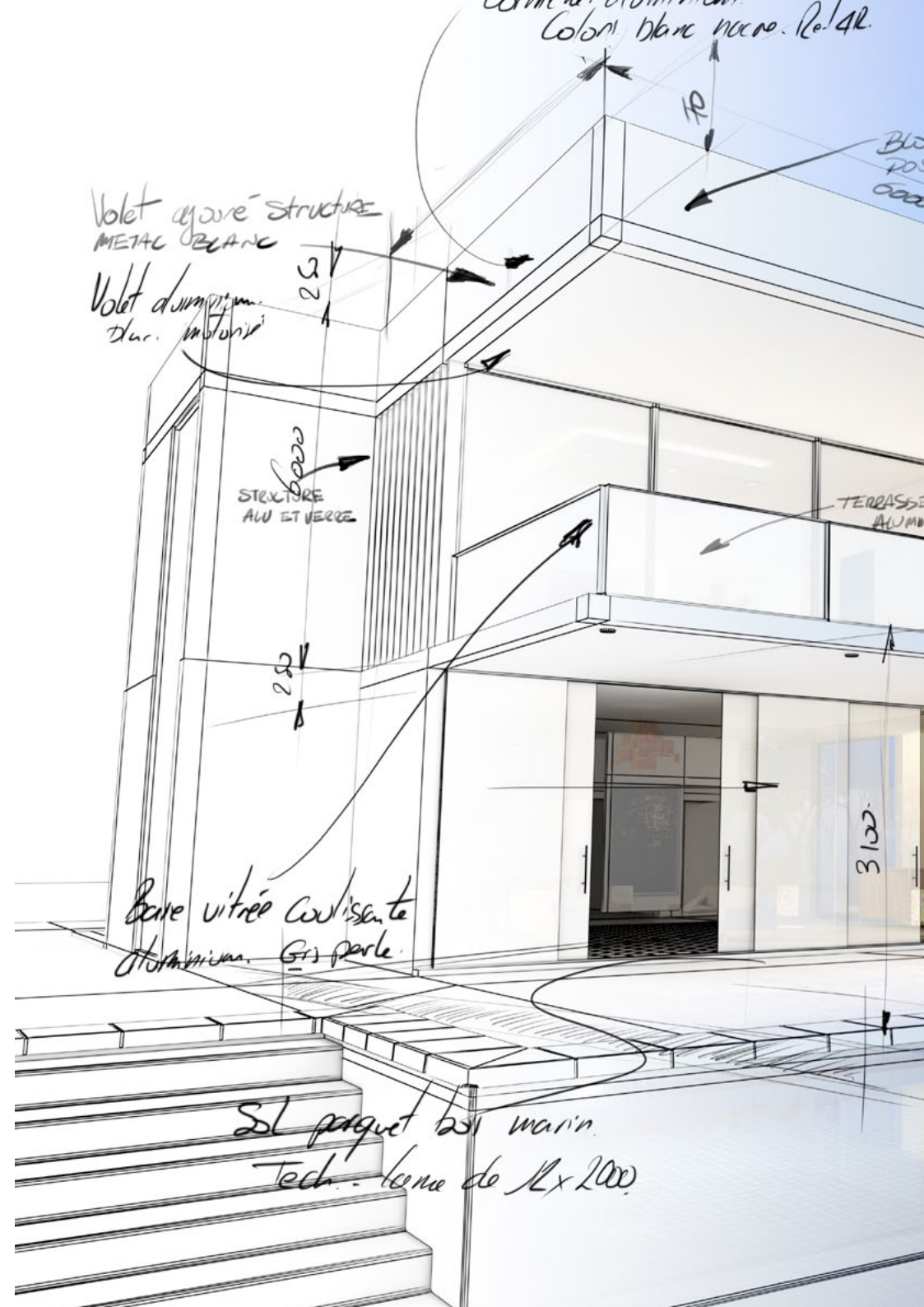
Specific Objectives

- Handle tools such as Grasshopper and Autodesk 360 to create adaptive and customized designs that meet customers' expectations
- Apply topological optimization and sustainable design strategies in parametric projects

" *TECH will rely on state-of-the-art multimedia resources for this university program, including explanatory videos and interactive summaries"*

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Course Management

Loyal to its philosophy of providing the most complete and updated university programs in the educational panorama, TECH carries out a rigorous process to form their respective teaching staff. Thanks to this effort, this Postgraduate Certificate will be taught by prestigious experts in Parametric Design and Digital Manufacturing. These professionals have an extensive professional background, where they have helped companies to design innovative and sustainable architectural designs. Therefore, students will enjoy an immersive experience that will help them experience a significant leap in quality in their careers as architects.
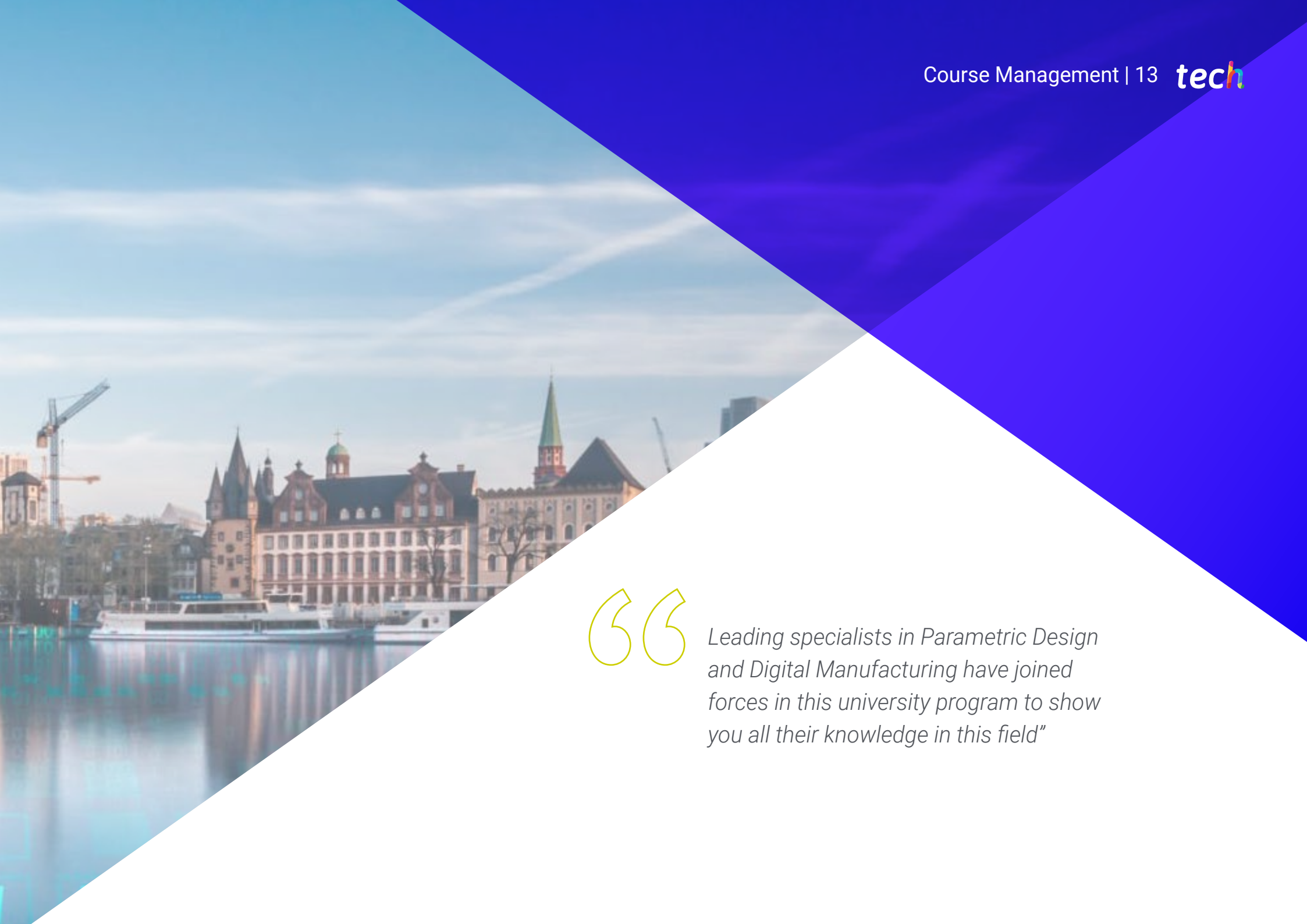
Leading specialists in Parametric Design and Digital Manufacturing have joined forces in this university program to show you all their knowledge in this field"

Management

Dr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometeus Global Solutions
- CTO at Korporate Technologies
- CTO at AI Shepherds GmbH
- Consultant and Strategic Business Advisor at Alliance Medical
- Director of Design and Development at DocPath
- PhD in Psychology from the University of Castilla La Mancha
- PhD in Economics, Business and Finance from the Camilo José Cela University
- PhD in Psychology from University of Castilla La Mancha
- Master's Degree in Executive MBA from the Isabel I University
- Master's Degree in Sales and Marketing Management, Isabel I University
- Expert Master's Degree in Big Data by Hadoop Training
- Master's Degree in Advanced Information Technologies from the University of Castilla La Mancha
- Member of: SMILE Research Group

Professors

Mr. Peralta Vide, Javier

- Technological Coordinator and Content Developer at Aranzadi Laley Formación
- Collaborator at CanalCreativo
- Collaborator at Dentsu
- Collaborator at Ai2
- Collaborator at BoaMistura
- Freelance Architect at Editorial Nivola, Biogen Technologies, Releaf, etc.
- Specialization by Revit Architecture Metropa School
- Graduate in Architecture and Urbanism from the University of Alcalá

Ms. Martínez Cerrato, Yésica

- Responsible for Technical Training at Securitas Seguridad España
- Education, Business and Marketing Specialist
- Product Manager in Electronic Security at Securitas Seguridad España
- Business Intelligence Analyst at Ricopia Technologies
- Computer Technician and Responsible for OTEC computer classrooms at the University of Alcalá de Henares
- Collaborator in the ASALUMA Association
- Degree in Electronic Communications Engineering at the Polytechnic School, University of Alcalá de Henares

04
Structure and Content

This university program has been designed by recognized experts in Parametric Design and Digital Manufacturing. The curriculum will delve into the use of Grasshopper software so that students can design architectural elements adapted to the specific needs of users. Along these lines, the syllabus will delve into the implementation of robotics technologies such as KUKA PRC, which will allow professionals to perform tasks such as cutting, assembly or finishing with high precision. In addition, the program will analyze the use of Fusion 360 to design highly adaptable architectural systems.
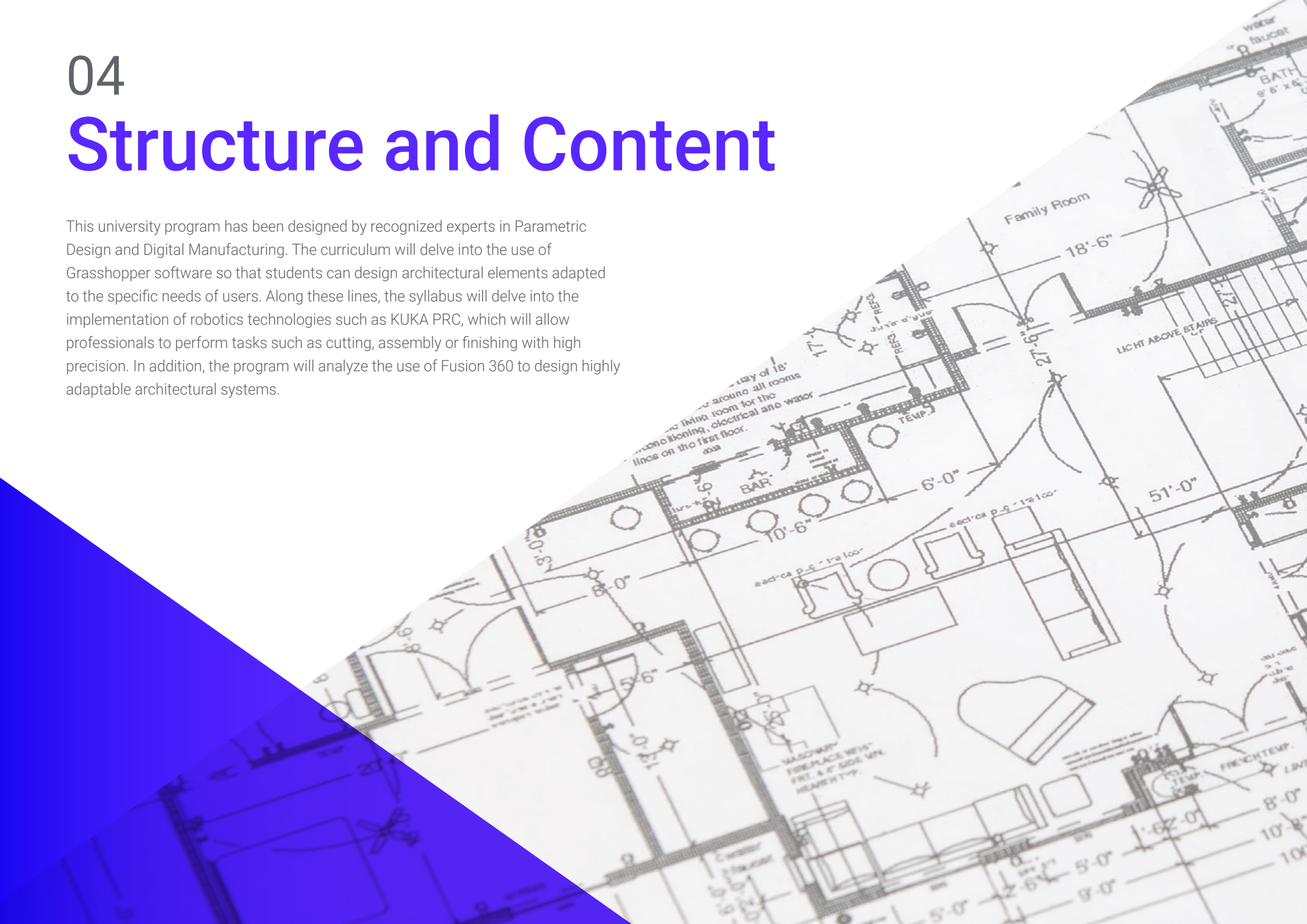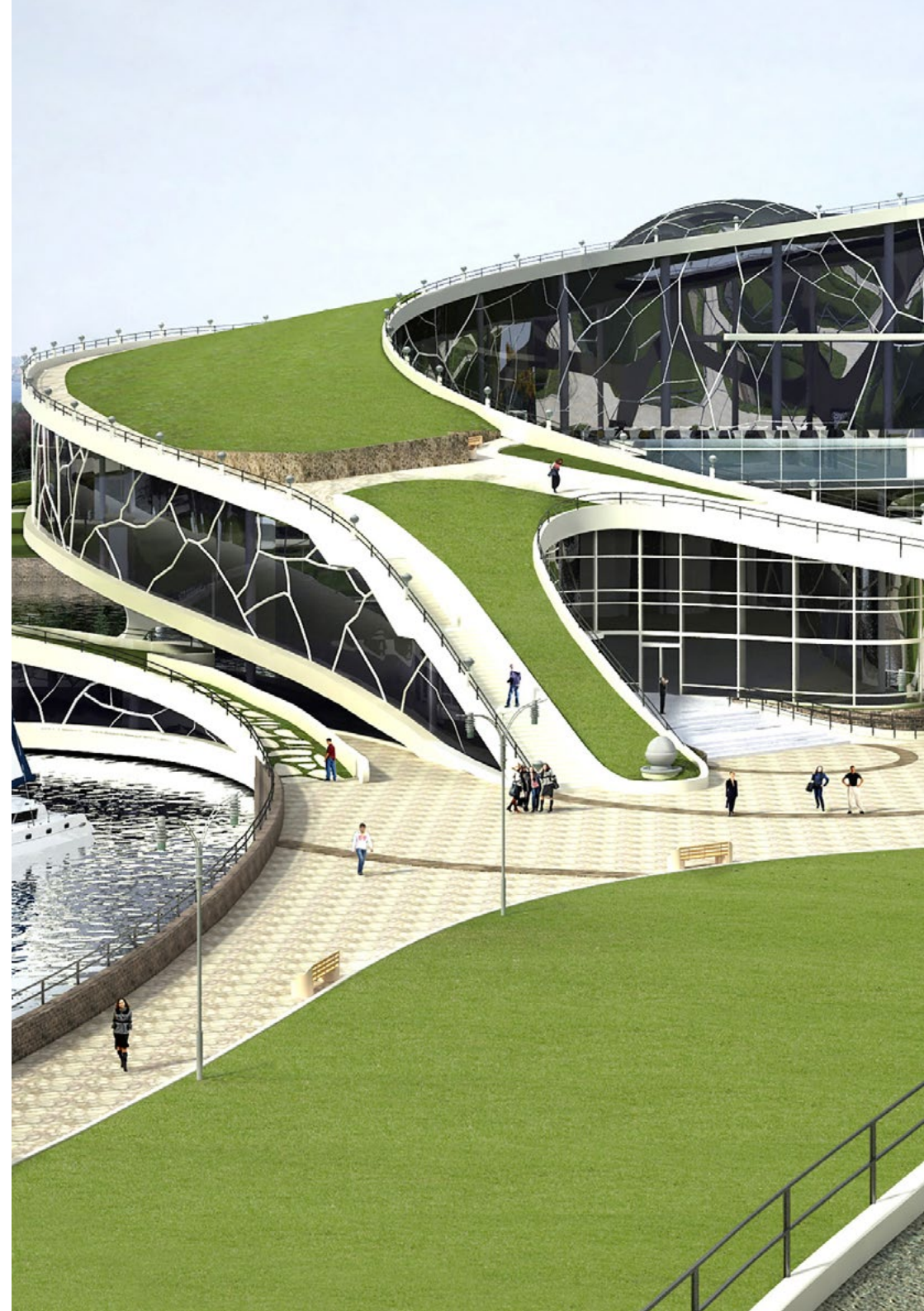
You will apply topological optimization techniques and life cycle analysis integrating Artificial Intelligence to improve the energy efficiency of architectural projects"

Module 1. Parametric Design and Digital Manufacturing

1.1. Advances in Parametric Design and Digital Fabrication with Grasshopper

　1.1.1. Using Grasshopper to Create Complex Parametric Designs

　1.1.2. Integrating AI into Grasshopper to Automate and Optimize Design

　1.1.3. Flagship Projects Using Parametric Design for Innovative Solutions

1.2. Algorithmic Optimization in Design with Generative Design

　1.2.1. Application of Generative Design for Algorithmic Optimization in Architecture

　1.2.2. Using AI to Generate Efficient and Novel Design Solutions

　1.2.3. Examples of How Generative Design Has Improved the Functionality and Aesthetics of Architectural Projects

1.3. Digital Fabrication and Robotics in Construction with KUKA PRC

　1.3.1. Implementing Robotics Technologies such as KUKA PRC in Digital Fabrication

　1.3.2. Advantages of Digital Manufacturing in Precision, Speed and Cost Reduction

　1.3.3. Digital Manufacturing Case Studies Highlighting Successful Integration of Robotics in Architecture

1.4. Adaptive Design and Manufacturing with Autodesk Fusion 360

　1.4.1. Using Fusion 360 to Design Adaptive Architectural Systems

　1.4.2. Implementing AI in Fusion 360 for Mass Customization

　1.4.3. Innovative Projects Demonstrating the Potential for Adaptability and Customization

1.5. Sustainability in Parametric Design with Topology Optimization

　1.5.1. Applying Topology Optimization Techniques to Improve Sustainability

　1.5.2. Integrating AI to Optimize Material Usage and Energy Efficiency

　1.5.3. Examples of How Topological Optimization Has Improved the Sustainability of Architectural Projects

1.6. Interactivity and Spatial Adaptability with Autodesk Fusion 360

　1.6.1. Integrating Real-Time Data and Sensors to Create Interactive Architectural Environments

　1.6.2. Using Autodesk Fusion 360 in Adapting Design in Response to Environmental or Usage Changes

　1.6.3. Examples of Architectural Projects Using Spatial Interactivity to Improve User Experience

A flexible university program, without fixed schedules and with content available 24 hours a day. Enroll now!"

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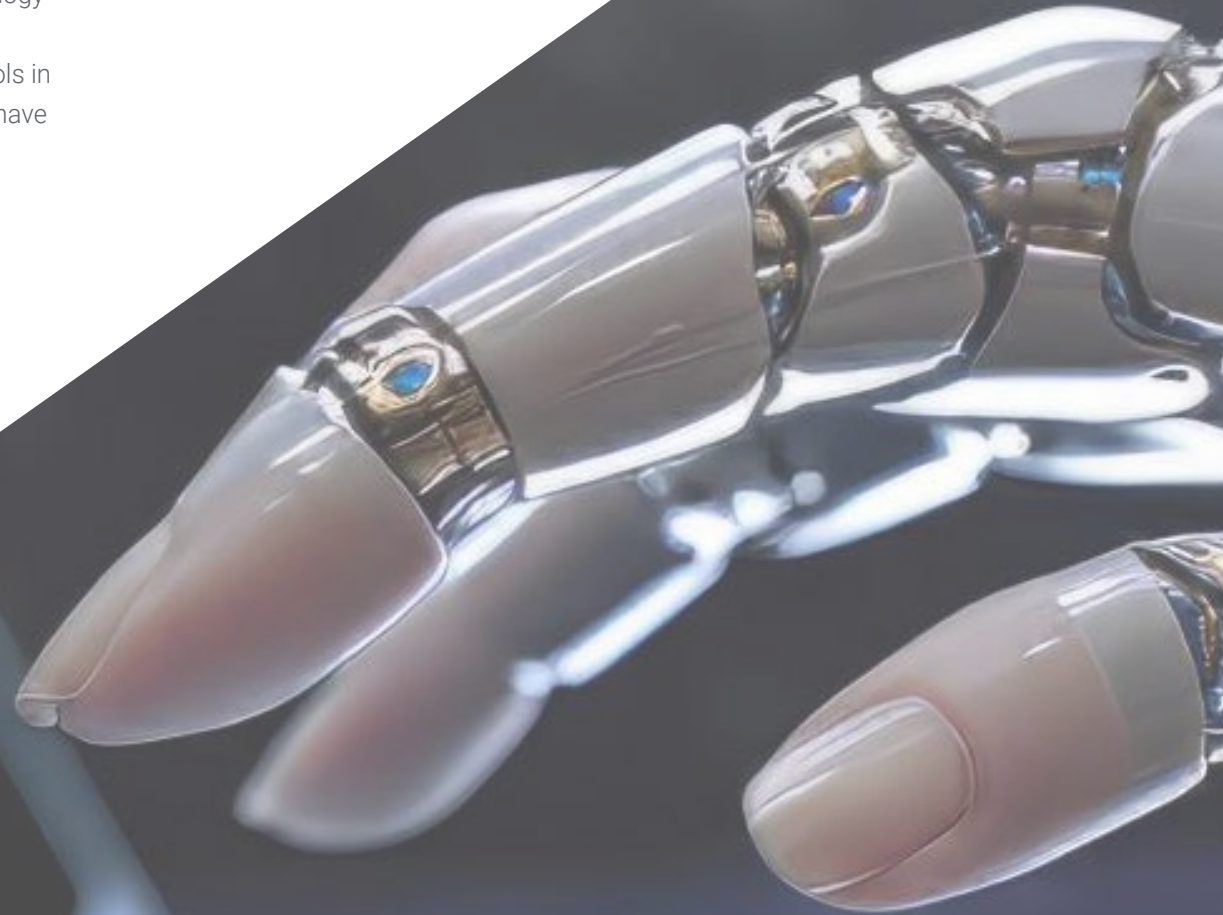
Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

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 has been the most widely used learning system among the world's leading Information Technology schools for as long as they have existed. 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 course, students 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 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.

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.

30%

10%

8%

20%

25%

4%

3%
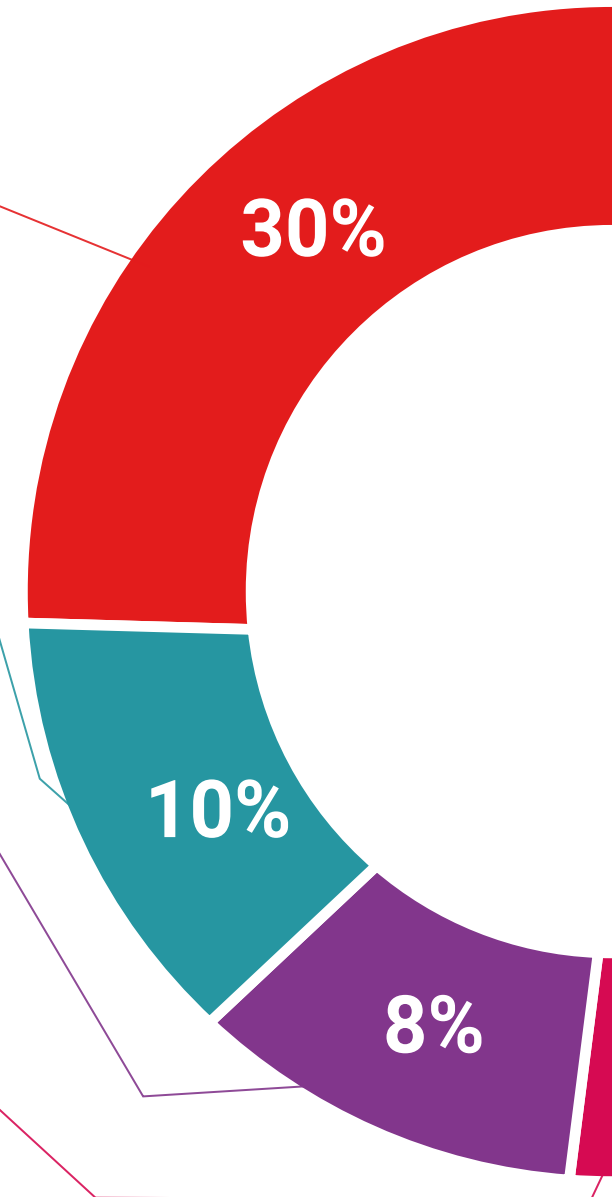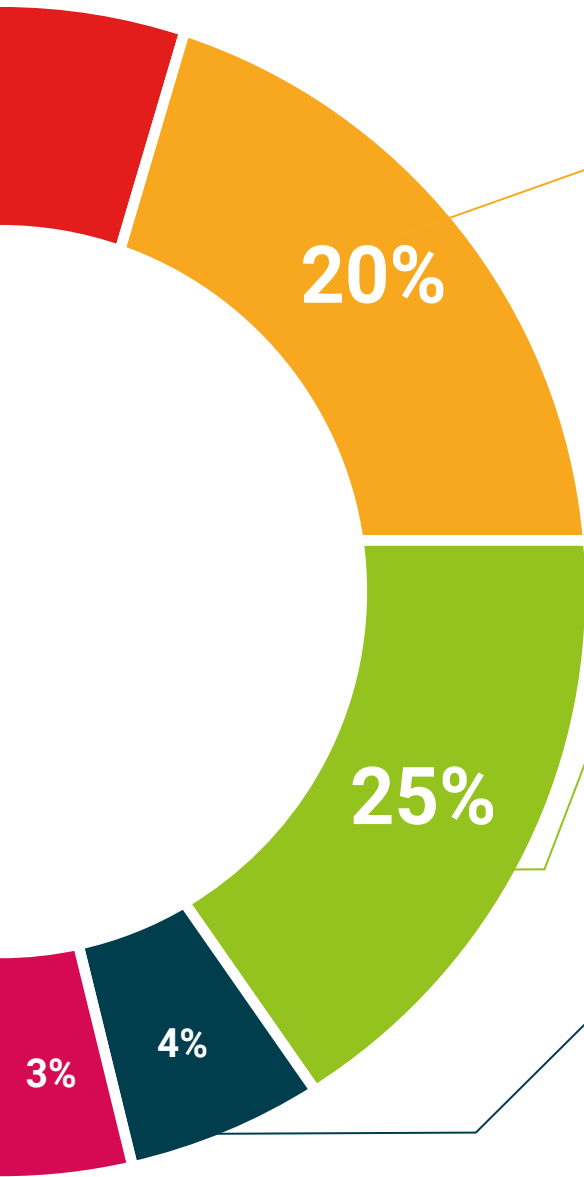
Case Studies

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.

Certificate

The Postgraduate Certificate in Parametric Design and Digital Manufacturing guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.

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

This private qualification will allow you to obtain a **Postgraduate Certificate in Parametric Design and Digital Manufacturing** 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** private qualification, 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 Parametric Design and Digital Manufacturing**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**

tech global university

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

Postgraduate Certificate in Parametric Design and Digital Manufacturing

This is a private qualification of 180 hours of duration equivalent to 6 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
Dean

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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