Postgraduate Certificate
Robotics. Robot Design and Modeling

tech technological university

tech technological university

Postgraduate Certificate
Robotics. Robot Design and Modeling

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

Website: **www.techtitute.com/us/engineering/postgraduate-certificate/robotics-robot-design-modeling**

Index

01
Introduction

The industrial and technological development that has taken place in recent years has had a significant influence on the advancement of robotics, which has even become part of our homes. A sector that has gained great importance in the educational environment, due to its wide range of job opportunities. This 100% online program provides the engineer with advanced technical knowledge with practical application in the field of robot design and modeling. All of this, in addition to a 100% online format, that can be accessed 24 hours a day and from any device that has an Internet connection.

> *A Postgraduate Certificate that will allow you to master kinematics and dynamics from the hands of active experts in the Robotics industry"*

The evolution of Robotics in recent years has accelerated. Current trends show that Robots will be even more present in various industry, especially sectors such as agriculture, and will form part of people's daily lives in their homes and in the cities in which they live. This Postgraduate Certificate, targeted towards professionals in the Engineering sector, provides the most up-to-date and essential knowledge for future professionals in the field of Robot Design and Modeling.

A comprehensive program in which students will have access to professionals with extensive experience and high qualifications in Software and Robotics Engineering. Thanks to them, the student will be immersed in mathematical models: Robot Kinematics and Dynamics. In addition, this university program will allow you to learn more about the most important types of robots today: Robot Manipulators, Aerial Mobile Robots and Land Mobile Robots.

A program that will also delve into the current state of Bio-Inspired robots, Humanoid Robots, Soft-Robots and Social Robots. All this with a practical approach focused on the use of ROS Technologies and the Gazebo Simulator, which will allow students to strengthen the theoretical concepts acquired in Robot Design and Modeling.

For this, you will have an updated syllabus with quality multimedia content that can be accessed at any time of the day, as there are no fixed timetable sessions. All you need is a mobile device, tablet or computer with internet access to connect to the virtual platform where the entire curriculum will be available to you from day one. This will allow you to view or download the teaching resources at any time. An online degree that allows you to advance in your professional career, in addition to an education that places you at the academic forefront.

This **Postgraduate Certificate in Robotics. Robot Design and Modeling** contains the most complete and up-to-date program on the market. The most important features include: Case studies presented by experts in robotic engineering

- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- Practical exercises where self-assessment can be used to improve learning
- Its special emphasis on innovative methodologies
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection

You are just one click away from accessing a program with the latest multimedia content in the field of robotics design, contributed by experts in the field"

" *Enroll in an education that will allow you to take a step further in your professional career in the field of Engineering"*

This Postgraduate Certificate allows you to advance and learn more about the software and hardware most commonly used in the field of Robotics today.

Thanks to this online certification, you can get the theoretical and practical learning that'll help you to grow and flourish within the Robotics industry.
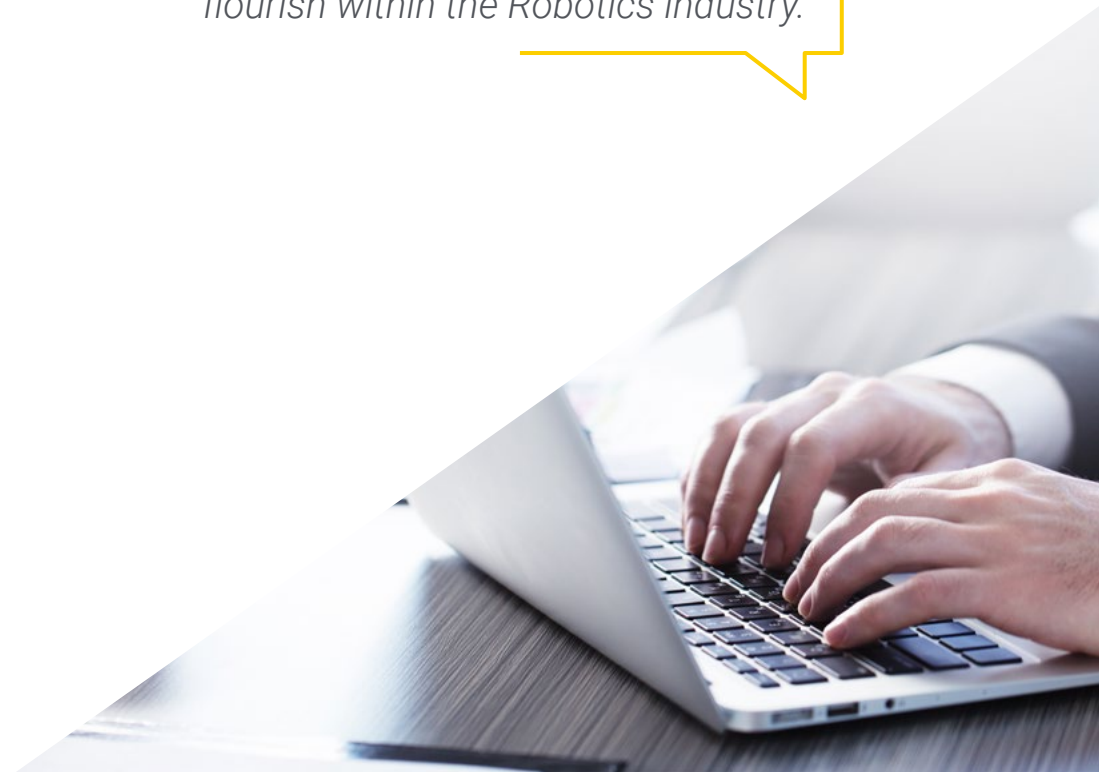
The program's teaching staff includes professionals from the sector who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

Its multimedia content, developed with the latest educational technology, will provide the professional 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 professional must try to solve the different professional practice situations that are presented throughout the academic course. This will be done with the help of an innovative system of interactive videos made by renowned experts.

02
Objectives

This Postgraduate Certificate has been created with the aim that the alumni who accesses it will find all of the information necessary for them to specialize in Robotics, specifically in Design and Modeling. To achieve this, students have some of the best and most dynamic academic tools at their disposal, which give this degree an extra dynamism and quality to achieve the maximum performance. Thus, at the end of the 6-week program, students will have mastered the use of the URDF Robot Modeling language, the Robot Operating System technology and have developed a deep understanding of the different types of robots currently in existence.

"

An online program designed exclusively for engineers who want to create the robots of the future"

General Objectives

- Develop the theoretical and practical foundations necessary to carry out a robot design and modeling project
- Provide the graduates with an exhaustive knowledge of the automation of industrial processes that will allow them to develop their own strategies
- Acquire the professional skills of an expert in automatic control systems in Robotics

Specific Objectives

- Delve into the use of Gazebo Simulation Technology
- Master the use of the URDF Robot Modeling language
- Develop specialized knowledge in the use of Robot Operating System technology
- Model and Simulate Manipulator Robots, Land Mobile Robots, Air Mobile Robots and Model and Simulate Aquatic Mobile Robots

"

Achieve the goals that you have set for yourself. The Robotics industry is both the present and the future. Click and enroll now"

03
Course Management

For all of its degrees, TECH selects the teaching staff whose academic and professional qualities align closely with the philosophy of the institution and with the demands of each sector. As a result, the students that take this online program will have a teaching team with experience in the Robotics industry at their disposal, which will provide them with the most relevant knowledge in this area in a practical way, allowing them to prosper professionally in this sector.

"
An expert teaching team in Robotics will be your ally during the 150 teaching hours of this university degree"

Management

Dr. Ramón Fabresse, Felipe

- Senior Software Engineer at Acurable
- NLP Software Engineer at Intel Corporation
- Software Engineer in CATEC, Indisys
- Researcher in Aerial Robotics at the University of Seville
- PhD Cum Laude in Robotics, Autonomous Systems and Telerobotics at the University of Seville
- Degree in Computer Engineering at the University of Seville
- Master's Degree in Robotics, Automation and Telematics at the University of Seville

Professors

Dr. Íñigo Blasco, Pablo

- Software Engineer at PlainConcepts
- Founder of Intelligent Behavior Robots
- Robotics Engineer at CATEC Advanced Center for Aerospace Technologies
- Developer and Consultant at Syderis
- PhD in Industrial Informatics Engineering at the University of Seville
- Degree in Computer Engineering at the University of Seville
- Master in Software Engineering and Technology

04

Structure and Content

The curriculum of this university degree has been designed by a specialized teaching team that will provide the most updated knowledge in the field of robotics. During the 150 teaching hours of this course, students will learn more about mathematical modeling, hardware and software architectures, kinematics, types of existing robots and the most commonly used simulators. All this with a Relearning learning system, which will facilitate the acquisition of knowledge in a more natural and progressive way, thus reducing the long hours of study that must be devoted to other teaching methods.

Access an updated curriculum which gives you the opportunity to deepen your understanding of mathematical modeling in robots"

Module 1. Robotic. Robot Design and Modeling

1.1. Robotics and Industry 4.0
    1.1.1. Robotics and Industry 4.0
    1.1.2. Application Fields and Use Cases
    1.1.3. Sub-Areas of Specialization in Robotics

1.2. Robot Hardware and Software Architectures
    1.2.1. Hardware Architectures and Real-Time
    1.2.2. Robot Software Architectures
    1.2.3. Communication Models and Middleware Technologies
    1.2.4. *Robot Operating System* (ROS) Software Integration

1.3. Mathematical Modeling of Robots
    1.3.1. Mathematical Representation of Rigid Solids
    1.3.2. Rotations and Translations
    1.3.3. Hierarchical State Representation
    1.3.4. Distributed Representation of the State in ROS (TF Library)

1.4. Robot Kinematics and Dynamics
    1.4.1. Kinematics
    1.4.2. Dynamics
    1.4.3. Underactuated Robots
    1.4.4. Redundant Robots

1.5. Robot Modeling and Simulation
    1.5.1. Robot Modeling Technologies
    1.5.2. Robot Modeling with URDF
    1.5.3. Robot Simulation
    1.5.4. Modeling with Gazebo Simulator

1.6. Robot Manipulators
    1.6.1. Types of Manipulator Robots
    1.6.2. Kinematics
    1.6.3. Dynamics
    1.6.4. Simulation
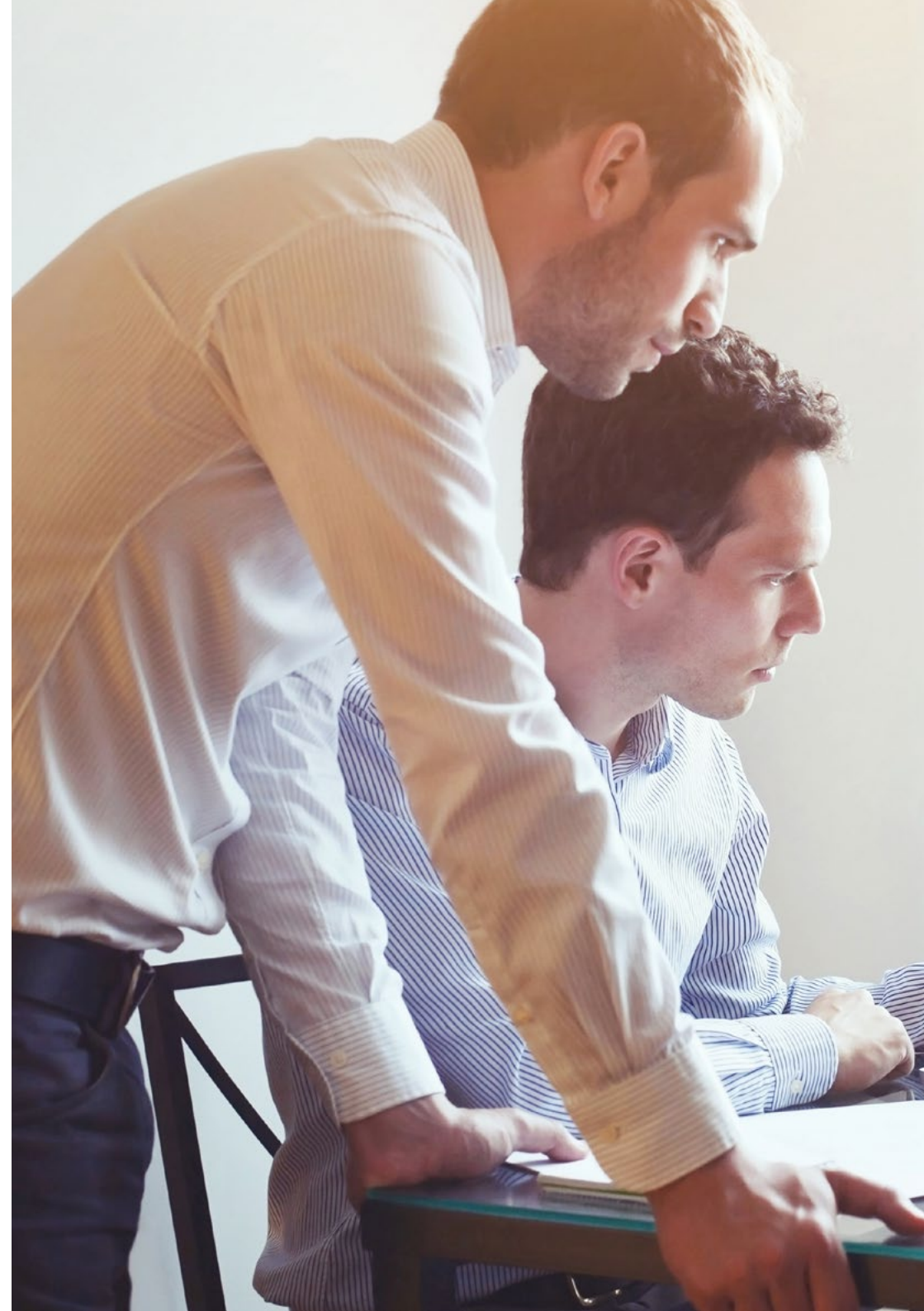
A qualification designed to help you progress in your Robotics career. Enroll now and develop your career with TECH"

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"*
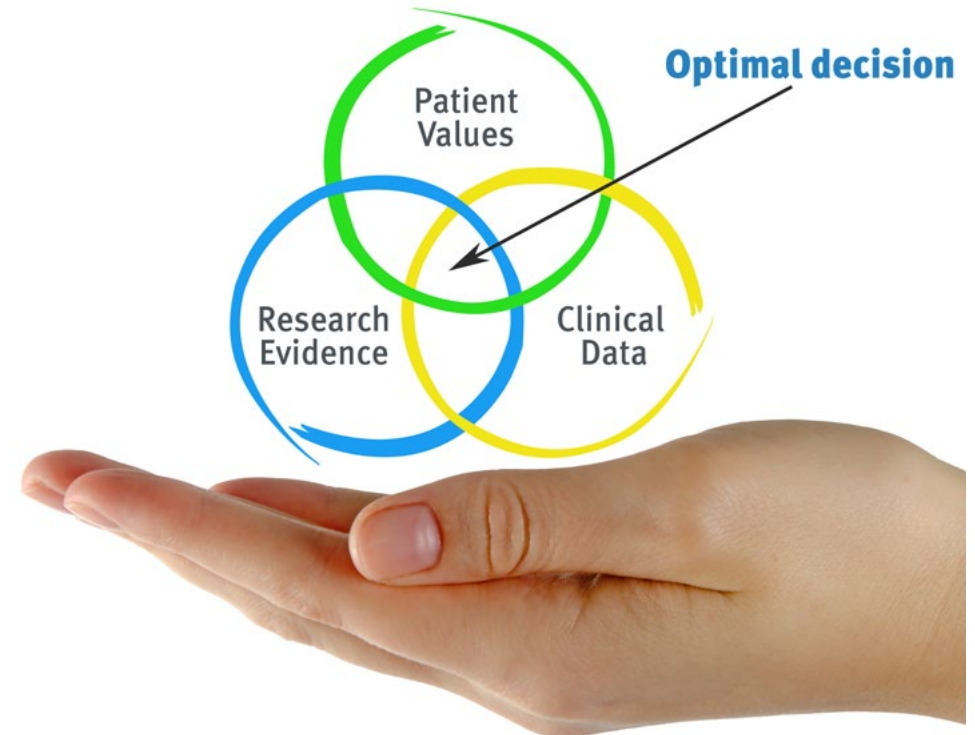
You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.

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.

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 Robotics. Robot Design and Modeling guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate 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 Certificate in Robotics. Robot Design and Modeling** 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 diploma issued by **TECH Technological University** will reflect the qualification obtained in the Postgrduate Certificate, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Certificate in Robotics. Robot Design and Modeling**

Official Nº of Hours: **150 h.**

tech technological university

Awards the following

DIPLOMA

to

Mr./Ms. _____, with identification number _____.
For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Robotics. Robot Design and Modeling

This is a qualification awarded by this University, equivalent to 150 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro
Dean

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 EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

tech technological university

Postgraduate Certificate
Robotics. Robot Design and Modeling

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

Postgraduate Certificate
Robotics. Robot Design and Modeling

tech technological university