

Postgraduate Certificate Tissue Engineering and Regenerative Medicine



Postgraduate Certificate Tissue Engineering and Regenerative Medicine

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

Website: www.techtitude.com/in/engineering/postgraduate-certificate/tissue-engineering-regenerative-medicine

Index

01

Introduction

p. 4

02

Objectives

p. 8

03

Course Management

p. 12

04

Structure and Content

p. 16

05

Methodology

p. 20

06

Certificate

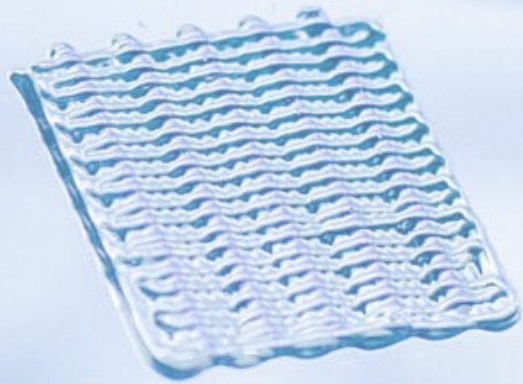
p. 28

01

Introduction

One of the fields that is producing the most fruitful advances is biomedical engineering. Thanks to the joint efforts of engineers and scientists, there are many new developments in areas such as Regenerative Medicine and Tissue Engineering. This establishes a very favorable framework for all engineers seeking a modern specialization, with the potential for further growth in the future. It is precisely in response to this demand that this university TECH program was created, bringing together the most avant-garde scientific postulates and practical advances. The engineer will be able to get up to date on everything related to Tissue Engineering and Regenerative Medicine in a convenient 100% online format.





“

Get up to date on the most relevant issues surrounding Tissue Engineering and Regenerative Medicine, including skin grafts for major burns and gene therapies”

The potential of cutting-edge technologies such as nanoparticles, bionanomaterials, gene therapies or tissue engineering itself is almost unlimited. From applications in the circulatory, respiratory and reproductive systems to a progressive adaptation to the most urgent clinical needs, this is one of the most promising areas of engineering research in recent years.

Driven by the present and future relevance of this specialization, TECH has assembled a teaching team of the highest level to create this Postgraduate Certificate, specifically focused on Tissue Engineering and Regenerative Medicine. The teaching group itself has contributed its practical vision to the program, which together with the most current scientific theses, make up an integral academic offer aimed at completely updating the engineer's knowledge.

In addition, it is important to highlight the ease of being able to take this Postgraduate Certificate completely online, as there are no fixed schedules or classes of any kind. All the educational material is available from the first day in the virtual classroom and can be downloaded and studied at the pace chosen by the engineer.

This **Postgraduate Certificate in Tissue Engineering and Regenerative Medicine** contains the most complete and up-to-date program on the market. The most important features include:

- ♦ The development of case studies presented by experts in Biomedical 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



Delve into everything related to cutting-edge technologies such as Nanomedicine, biomaterials in Tissue Engineering and Cell Sheet Engineering"



Aim for leading Biotechnology companies with this specialization, which has the support of prestigious professors with international experience"

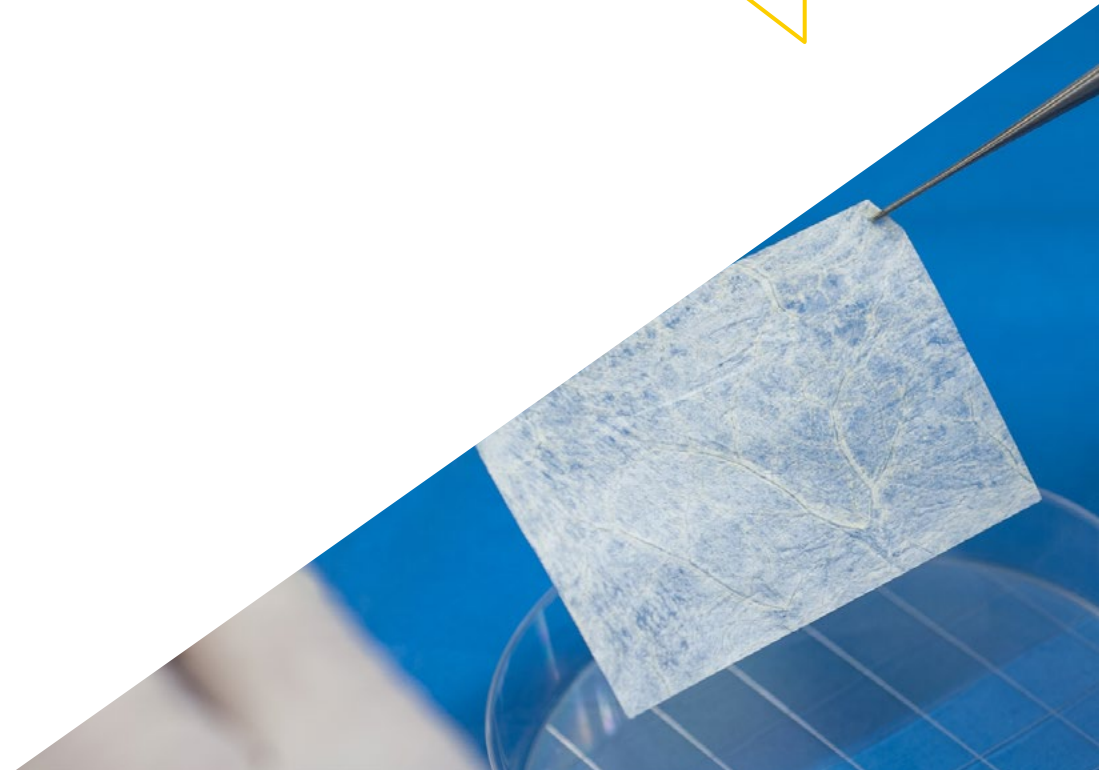
The program's teaching staff includes professionals from sector who contribute their work experience to this training program, as well as renowned specialists from leading societies and prestigious universities.

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 training 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 during the academic year. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

Lean on the world's largest online university, which provides you with the most advanced educational technology available today.

At TECH, you can adapt your studies to your own pace, choosing when and where you want to take on the course workload.



02 Objectives

Knowing that this is an issue of utmost importance for engineers of all specialties, TECH has set a very clear objective for this Postgraduate Certificate: to provide engineers with a reliable and effective update on everything related to Tissue Engineering and Regenerative Medicine. Accordingly, an educational study methodology is provided that will take the engineer, over the course of 6 weeks, through the most pressing issues and practical uses in this field.





“

Specialize in an area experiencing rapid growth and start to be sought after by the leading companies in Biomedicine"



General Objectives

- ♦ Generate specialized knowledge on the main types of biomedical signals and their uses
- ♦ Develop the physical and mathematical knowledge underlying biomedical signals
- ♦ Fundamentals of the principles governing signal analysis and processing systems
- ♦ Analyze the main applications, trends and lines of research and development in the field of biomedical signals
- ♦ Develop expertise in classical mechanics and fluid mechanics
- ♦ Analyze the general functioning of the motor system and its biological mechanisms
- ♦ Develop models and techniques for the design and prototyping of interfaces based on design methodologies and their evaluation
- ♦ Provide the student with critical skills and tools for interface assessment
- ♦ Explore the interfaces used in pioneering technology in the biomedical sector
- ♦ Analyze the fundamentals of medical imaging acquisition, inferring its social impact
- ♦ Develop specialized knowledge about the operation of the different imaging techniques, understanding the physics behind each modality
- ♦ Identify the usefulness of each method in relation to its characteristic clinical applications
- ♦ Investigate the post-processing and management of acquired images
- ♦ Use and design biomedical information management systems
- ♦ Analyze current digital health applications and design biomedical applications in a hospital setting or clinical center





Specific Objectives

- ◆ Generate specialized knowledge on histology and functioning of the cellular environment
- ◆ Review the current status of tissue engineering and regenerative medicine
- ◆ Address the main challenges facing tissue engineering
- ◆ Present the most promising techniques and the future of tissue engineering
- ◆ Develop the main trends of the future of regenerative medicine
- ◆ Analyze the regulation of tissue engineered products
- ◆ Examine the interaction of biomaterials with the cellular environment and the complexity of this process



Thanks to TECH's advanced methodology, you will enhance your personal and professional skills throughout the program"

03

Course Management

The teachers assembled by TECH for this Postgraduate Certificate accumulate cutting-edge experience at the forefront of biomedicine. This means that engineers will have access to teaching material that is not only reinforced by complementary readings and case studies, but also draws on the experience of professionals who work with the most important biomedical advances on a day-to-day basis.





“

You have the support and security of a faculty committed to you, willing to help you at all times throughout the Postgraduate Certificate"

Management



Mr. Ruiz Díez, Carlos

- ♦ Researcher at the National Microelectronics Center of the CSIC
- ♦ Researcher. Composting Research Group of the Department of Chemical, Biological and Environmental Engineering of the UAB
- ♦ Founder and product development at NoTime Ecobrand, a fashion and recycling brand
- ♦ Development cooperation project manager for the NGO Future Child Africa in Zimbabwe
- ♦ Graduate in Industrial Technologies Engineering from Pontificia de Comillas University ICAI
- ♦ Master's Degree in Biological and Environmental Engineering from the Autonomous University of Barcelona
- ♦ Master's Degree in Environmental Management from the Universidad Española a Distancia (Spanish Open University)

Professors

Mr. Rubio Rey, Javier

- ♦ Research Trainee in the *Parkinson's disease project: Investigating the cofilin-1 and alpha-synuclein protein interaction* under the direction of Dr. Richard Parsons at Kings College London
- ♦ Degree in Pharmacy from CEU San Pablo University
- ♦ Degree in Biotechnology from CEU San Pablo University
- ♦ Double Degree in Pharmacy and Biotechnology



04

Structure and Content

Having accumulated a wealth of experience over thousands of university programs, TECH has refined its teaching methodology, Relearning, to the maximum. Thanks to this methodology, professionals are guaranteed to obtain a progressive and effective education on issues that not only cover Tissue Engineering and Regenerative Medicine itself, but also delve into the legal aspects and future perspectives on them.



“

Take advantage of the breadth and depth of this syllabus to maximize your knowledge of Tissue Engineering and Regenerative Medicine"

Module 1. Tissue Engineering

- 1.1. Histology
 - 1.1.1. Cellular Organization in Higher Structures: Tissues and Organs
 - 1.1.2. Cell Cycle: Tissue Regeneration
 - 1.1.3. Regulation: Interaction with the Extracellular Matrix
 - 1.1.4. Importance of Histology in Tissue Engineering
- 1.2. Tissue Engineering
 - 1.2.1. Tissue Engineering
 - 1.2.2. Scaffolding
 - 1.2.2.1. Properties
 - 1.2.2.2. The Ideal Scaffolding
 - 1.2.3. Biomaterials for Tissue Engineering
 - 1.2.4. Bioactive Materials
 - 1.2.5. Cells
- 1.3. Stem Cells
 - 1.3.1. Stem Cells
 - 1.3.1.1. Potentiality
 - 1.3.1.2. Tests to Evaluate Potentiality
 - 1.3.2. Regulation: Niche
 - 1.3.3. Types of Stem Cells
 - 1.3.3.1. Embryonic
 - 1.3.3.2. IPS
 - 1.3.3.3. Adult Stem Cells
- 1.4. Nanoparticles
 - 1.4.1. Nanomedicine: Nanoparticles
 - 1.4.2. Types of Nanoparticles
 - 1.4.3. Methods of Obtaining
 - 1.4.4. Bionanomaterials in Tissue Engineering
- 1.5. Genetic Therapy
 - 1.5.1. Genetic Therapy
 - 1.5.2. Uses: Gene Supplementation, Cell Replacement, Cellular Reprogramming
 - 1.5.3. Vectors for the Introduction of Genetic Material
 - 1.5.3.1. Viral Vectors
- 1.6. Biomedical Applications of Tissue Engineering Products Regeneration, Grafts and Replacements
 - 1.6.1. *Cell Sheet Engineering*
 - 1.6.2. Cartilage Regeneration: Joint Repair
 - 1.6.3. Corneal Regeneration
 - 1.6.4. Skin Grafting for Major Burn Injuries
 - 1.6.5. Oncology
 - 1.6.6. Bone Replacement
- 1.7. Biomedical Applications of Tissue Engineering Products Circulatory, Respiratory and Reproductive System
 - 1.7.1. Cardiac Tissue Engineering
 - 1.7.2. Hepatic Tissue Engineering
 - 1.7.3. Lung Tissue Engineering
 - 1.7.4. Reproductive Organs and Tissue Engineering
- 1.8. Quality Control and Biosecurity
 - 1.8.1. NCF Applied to Advanced Therapy Drugs
 - 1.8.2. Quality Control
 - 1.8.3. Aseptic Processing: Viral and Microbiological Safety
 - 1.8.4. Cell Production Unit: Characteristics and Design



- 1.9. Legislation and Regulation
 - 1.9.1. Current Legislation
 - 1.9.2. Authorization
 - 1.9.3. Regulation of Advanced Therapies
- 1.10. Future Perspectives
 - 1.10.1. Current Status of *Tissue Engineering*
 - 1.10.2. Clinical Needs
 - 1.10.3. Main Challenges at Present
 - 1.10.4. Focus and Future Challenges

“

You will have 24-hour access to the virtual classroom, which gives you the freedom to balance this Postgraduate Certificate with your professional and personal responsibilities”

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 Certificate in Tissue Engineering and Regenerative Medicine guarantees students, in addition to the most rigorous and up-to-date education, access to a qualification issued by TECH Technological University.



“

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

This **Postgraduate Certificate in Tissue Engineering and Regenerative Medicine** contains the most complete and up-to-date program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Certificate** issued by **TECH Technological University** via tracked delivery*.

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

Title: **Postgraduate Certificate in Tissue Engineering and Regenerative Medicine**

Official N° of Hours: **150 h.**



*Apostille Convention. In the event that the student wishes to have their paper certificate issued with an apostille, TECH EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

future
health confidence people
education information tutors
guarantee accreditation teaching
institutions technology learning
community commitment
personalized service innovation
knowledge present
development language
virtual classroom



Postgraduate Certificate Tissue Engineering and Regenerative Medicine

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

Postgraduate Certificate Tissue Engineering and Regenerative Medicine