

Postgraduate Certificate
Course on Coupling
with CFD Simulations.
Multiphysics applications



Postgraduate Certificate Course on Coupling with CFD simulations. Multiphysics applications

- » Modality: **online**
- » Duration: **6 weeks**
- » Certificate: **TECH Technological University**
- » Schedule: **at your own pace**
- » Exams: **online**

Website: www.techtitute.com/us/information-technology/postgraduate-certificate/course-coupling-cfd-simulations-multiphysics-applications

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01

Introduction

Coupling with CFD Simulations and Multiphysics Applications are advanced computer modeling techniques that allow the simulation of systems involving multiple physical phenomena simultaneously. Computer science majors have a unique advantage in designing more accurate and efficient systems because they can simulate the behavior of complex systems and predict their performance under different conditions. For this reason, TECH Technological University has designed a degree that allows students to maximize their knowledge of aspects such as the Rules of the Game, Defense, Static Phases, Training Exercises and the Offensive System, among others. All this, thanks to a 100% online modality and with the most dynamic and practical multimedia materials available in the academic market.





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Become an expert in Multi-physics Applications, thanks to the largest digital university in the world, thanks to TECH Technological University”

Training in coupling with CFD simulations and multi-physics applications is essential for the design of more accurate and efficient systems in different industries, for advancing scientific knowledge and for competitiveness in the labor market. Computer science students who are educated in advanced simulation have the opportunity to apply their skills in diverse and exciting fields, contributing to the development of technologies that can improve the quality of people's lives.

For this reason, TECH Technological University has designed a University Postgraduate certificate Course on Coupling with CFD simulations, Multi-physics applications Techniques to provide students with the necessary skills and competencies to be able to perform their work as specialists with the highest possible efficiency and quality. Computer science students who are educated in advanced simulation have the opportunity to apply their skills in diverse and exciting fields, contributing to the development of technologies that can improve the quality of people's lives.

All this, through a convenient 100% online modality that allows Students to organize their schedules and studies, combining them with their other work and interests. In addition, this degree has the most Complete theoretical and practical materials on the market, which facilitates the student's study process and allows them to achieve their objectives quickly and effectively.

This **Postgraduate Certificate in Course on Coupling with CFD Simulations. Multiphysics applications** contains the most complete and up-to-date program on the market. The most important features include:

- ◆ Practical cases presented by experts in Coupling with CFD simulations
- ◆ The graphic, schematic and practical contents of the program provide Rehabilitation and practical information on those 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



Achieve a successful position in one of the most promising areas in the IT sector"

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Reach your full potential as a computer scientist, thanks to TECH Technological University and the most innovative materials you will find”

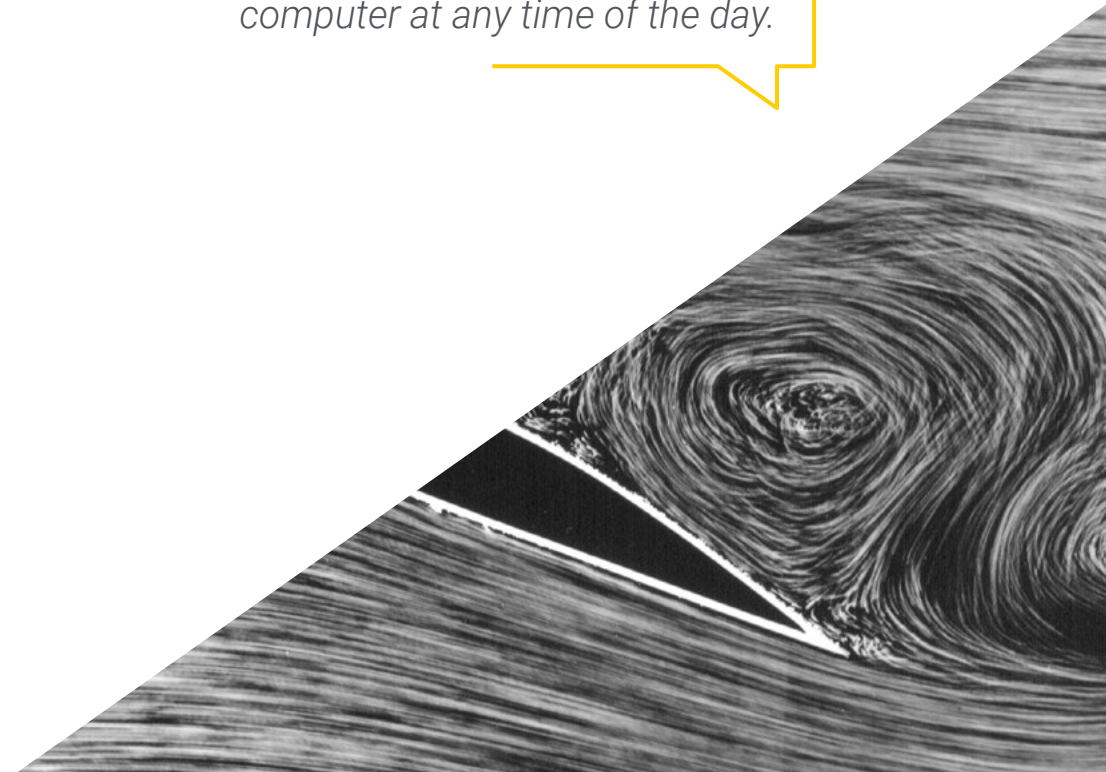
The program's teaching staff includes professionals from sector who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

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. For this purpose, the student will be assisted by an innovative interactive video system created by renowned experts.

Deepen your knowledge of Spectral Methods and Visualization Techniques from the comfort of your home and at any time of the day.

Access all content on Molecular Equilibrium, Supersonic Corner and CFD from your tablet, mobile or computer at any time of the day.



02 Objectives

The objective Final Assessment of this Postgraduate Course on Coupling with CFD simulations, Multi-physics applications is that the student acquires a precise update of his knowledge in this area. A update that will allow students to work with the highest possible quality in their work. All this, thanks to TECH Technological University and a 100% online modality that gives total freedom of organization and schedules to the student.



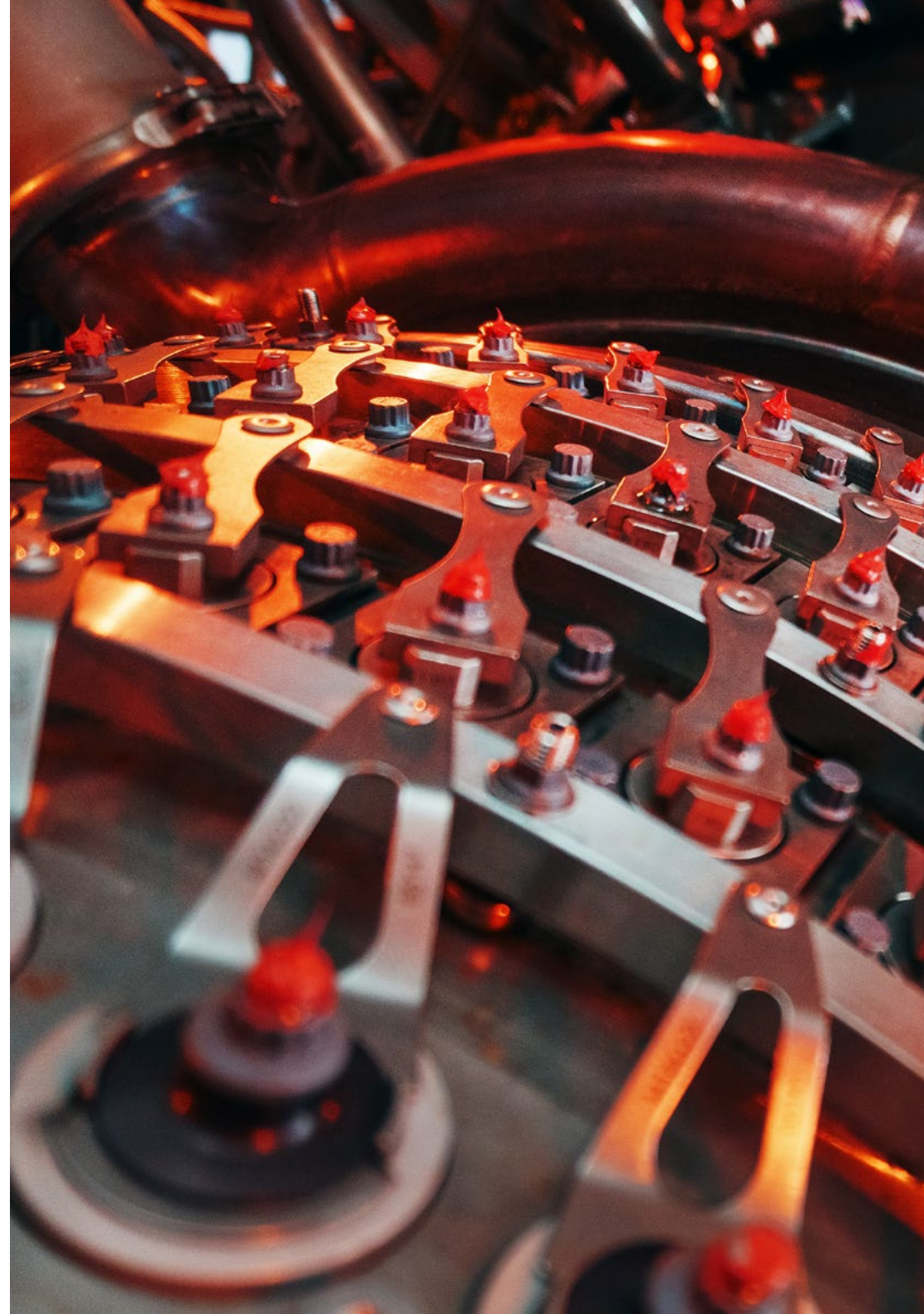
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Delve into all the essential aspects of the Advanced CFD Models Conditions, from the comfort of your home or work office”



General Objectives

- ◆ Establish the basis for the study of turbulence
- ◆ Develop CFD statistical concepts
- ◆ Determine the main computational techniques in turbulence research
- ◆ Generate specialized knowledge in the method of Finite Volumes
- ◆ Acquire specialized knowledge in fluid mechanics calculation techniques
- ◆ Examine the wall units and the different regions of a turbulent wall flow
- ◆ Determine the characteristics of compressible flows
- ◆ Examine multiple models and multiphase methods
- ◆ Develop expertise on multiple models and methods in multi-physics and thermal analysis
- ◆ Interpret the results obtained by correct post-processing





Specific Objectives

- ◆ Distinguish what type of physical interactions are to be simulated: fluid-structure, such as a wing subject to aerodynamic forces, fluid coupled with rigid body dynamics, such as simulating the motion of a buoy floating in the sea, or thermofluid, such as simulating the distribution of temperatures in a solid subject to air currents
- ◆ Distinguish the most common data exchange schemes between different simulation software and when one or the other can or is best to be applied
- ◆ Examine the various heat transfer models and how they can affect a fluid
- ◆ Model convection, radiation and diffusion phenomena from a fluid point of view, model sound creation by a fluid, model simulations with advection-diffusion terms to simulate continuous or particulate media and model reactive flows

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Exceed your highest expectations, thanks to a unique program with the most complete theoretical and practical materials on the academic market”

03

Course Management

In order to provide a Postgraduate of the highest quality and usefulness, TECH Technological University has selected professionals specialized in Advanced CFD Techniques as part of this teaching staff, who have been in charge of the design of the most advanced contents. Thus, you will study the learn from the best the keys to your professional development in a field that adapts to new technologies and the latest market advances.



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The most experienced management and the best teaching staff will provide you with the most up-to-date knowledge on Multi-physics Applications, preparing you to face the most demanding challenges”

Management



Dr. García Galache, José Pedro

- ♦ XFlow Development Engineer at Dassault Systèmes
- ♦ Doctor in Aeronautical Engineering from the Polytechnic University of Valencia
- ♦ Degree in Aeronautical Engineering from the Polytechnic University of Valencia
- ♦ Research Master's Degree in Fluid Mechanics by the Von Kármán Institute for Fluid Dynamics
- ♦ Programa de formación breve en el Instituto Von Kármán de Dinámica de Fluidos

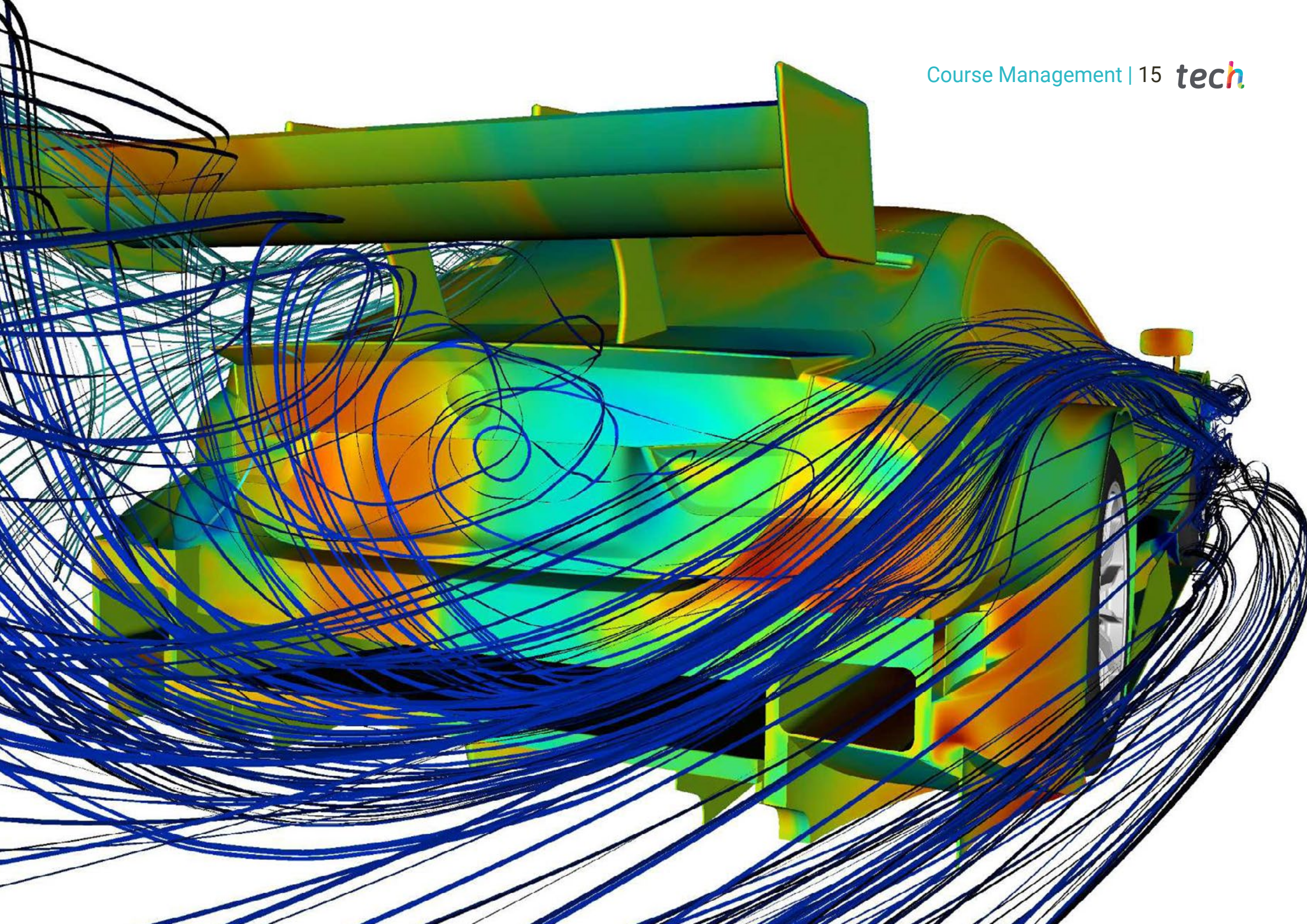
Professors

Mr. Mate Bueso, Enrique

- ♦ Senior Engineer for Thermal Conditioning and Aerodynamics at Siemens Gamesa
- ♦ Application Engineer and CFD R&D Manager at Dassault Systèmes
- ♦ Thermal Conditioning and Aerodynamics Engineer in Gamesa-Altran
- ♦ Fatigue and Damage Tolerance Engineer at Airbus-Atos
- ♦ R&D CFD Engineer at UPM
- ♦ Aeronautical Technical Engineer with specialization in Aircraft by UPM
- ♦ Master's Degree in Aerospace Engineering from Royal Institute of Technology of Stockholm

Ms. Pérez Tainta, Maider

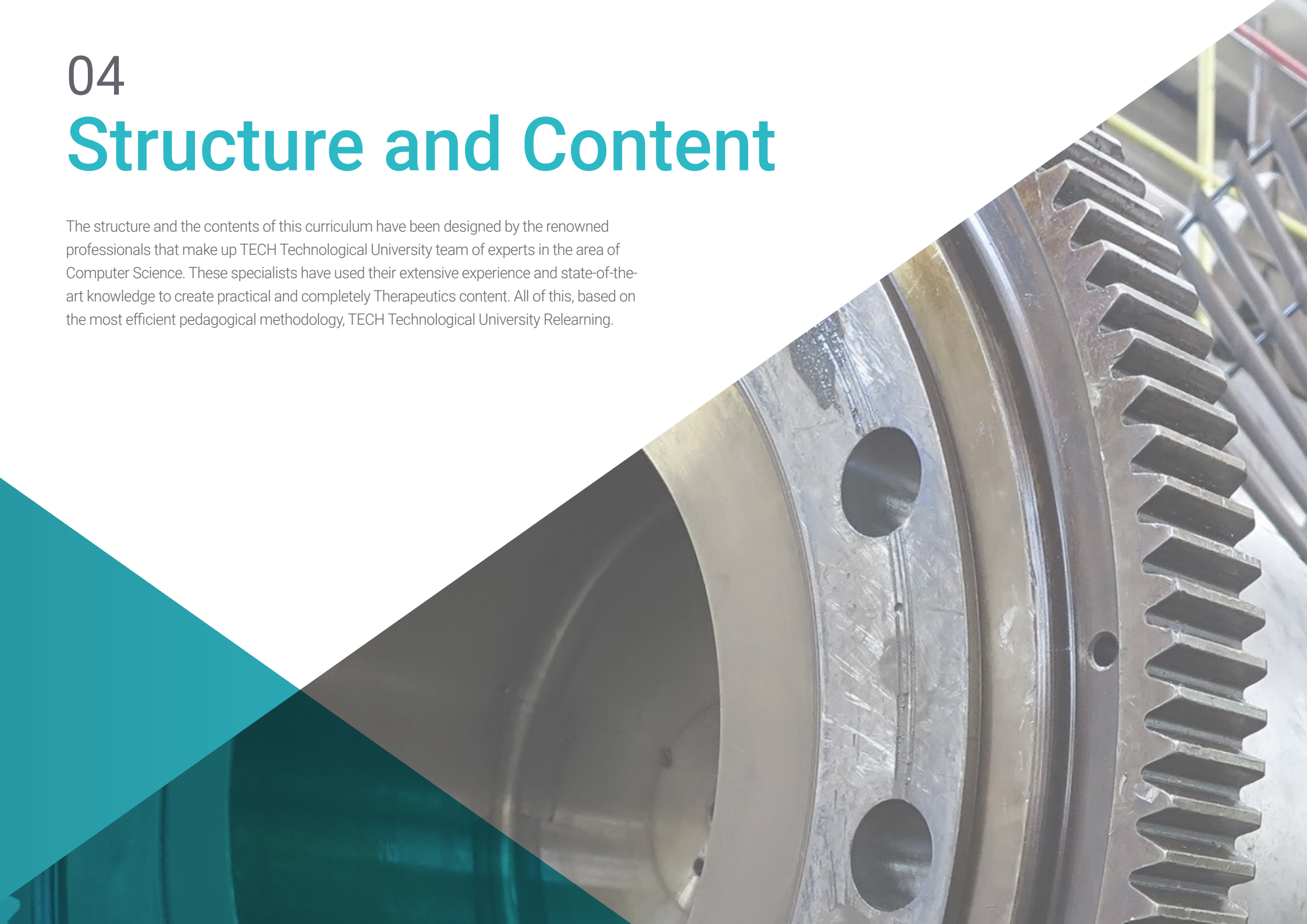
- ♦ Cement fluidization engineer at Kemex Ingesoa
- ♦ Process Engineer at J.M. Jauregui
- ♦ Researcher in hydrogen combustion at Ikerlan
- ♦ Mechanical engineer at Idom
- ♦ Graduate in Mechanical Engineering from the University of the Basque Country (UPV)
- ♦ Master's Degree in Mechanical Engineering
- ♦ Interuniversity Master's Degree in Fluid Mechanics
- ♦ Python programming course



04

Structure and Content

The structure and the contents of this curriculum have been designed by the renowned professionals that make up TECH Technological University team of experts in the area of Computer Science. These specialists have used their extensive experience and state-of-the-art knowledge to create practical and completely Therapeutics content. All of this, based on the most efficient pedagogical methodology, TECH Technological University Relearning.

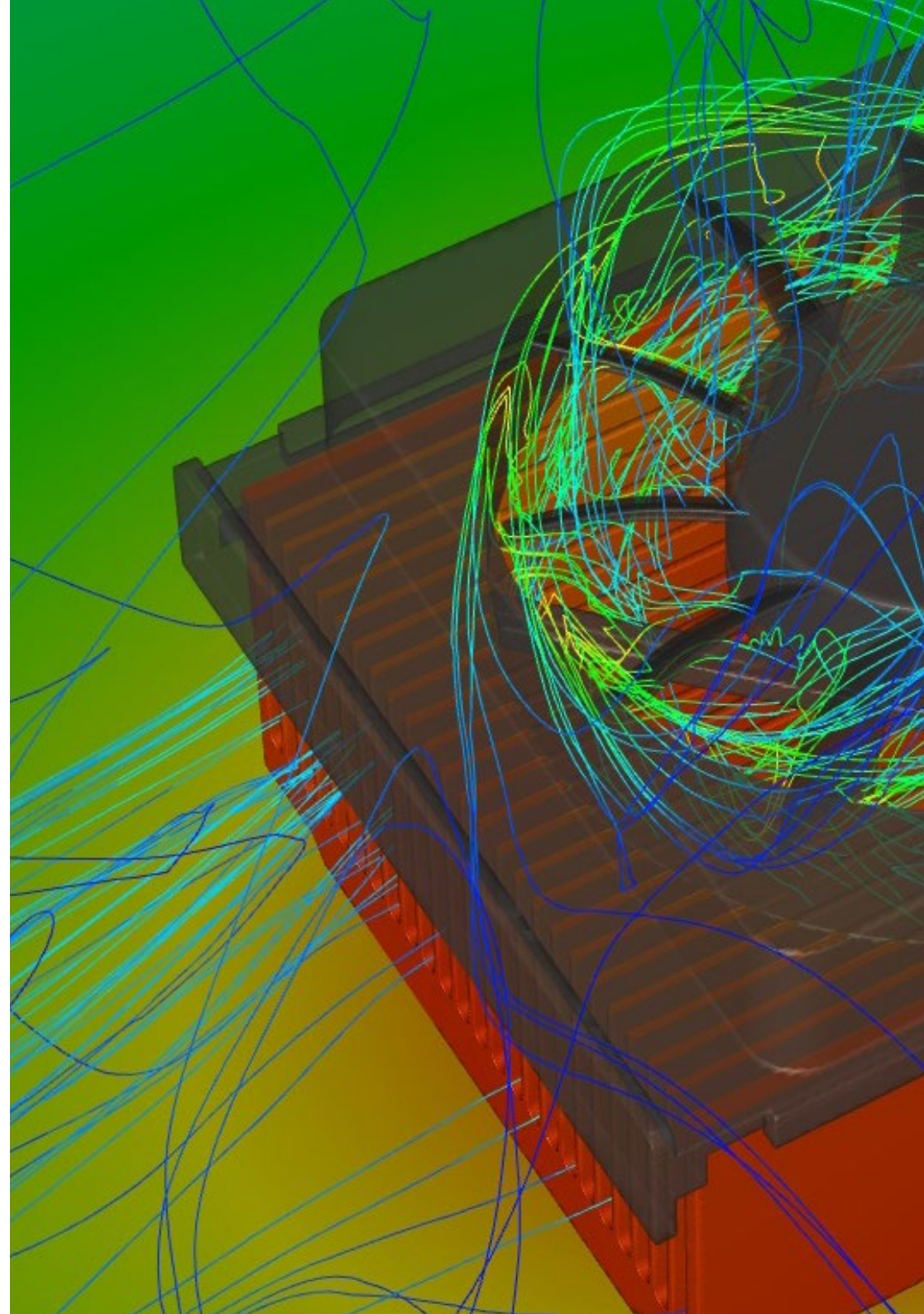


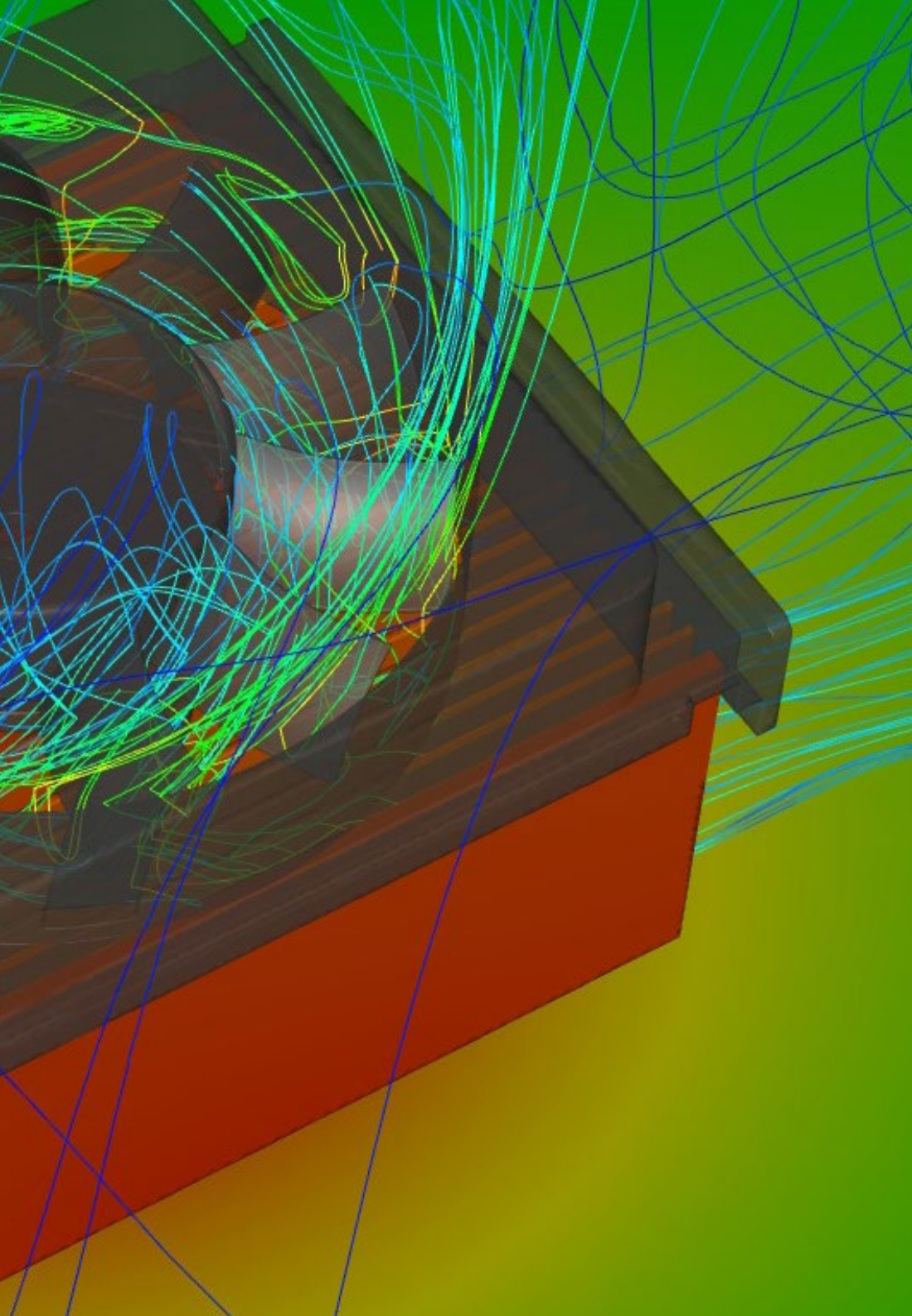
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The most comprehensive and up-to-date overview of Multiphysics Simulations and Bidirectional Cosimulation you will find in the academic market”

Module 1. Advanced CFD Models

- 1.1. Multi-physics
 - 1.1.1. Multi-physics Simulations
 - 1.1.2. System Types
 - 1.1.3. Application Examples
- 1.2. Unidirectional Cosimulation
 - 1.2.1. Unidirectional Cosimulation Advanced Aspects
 - 1.2.2. Information Exchange Schemes
 - 1.2.3. Applications
- 1.3. Bidirectional Cosimulation
 - 1.3.1. Bidirectional Cosimulation Advanced Aspects
 - 1.3.2. Information Exchange Schemes
 - 1.3.3. Applications
- 1.4. Convection Heat Transfer
 - 1.4.1. Convection Heat Transfer. Advanced Aspects
 - 1.4.2. Convective heat transfer equations
 - 1.4.3. Methods for solving convection problems
- 1.5. Conduction Heat Transfer
 - 1.5.1. Conduction Heat Transfer. Advanced Aspects
 - 1.5.2. Conductive heat transfer equations
 - 1.5.3. Methods of solving conduction problems
- 1.6. Radiation Heat Transfer
 - 1.6.1. Radiation Heat Transfer. Advanced Aspects
 - 1.6.2. Due to Radiation heat transfer equations
 - 1.6.3. Methods of solving Radiation problems
- 1.7. Solid-fluid-heat coupling
 - 1.7.1. Solid-fluid-heat coupling
 - 1.7.2. Solid-fluid thermal coupling
 - 1.7.3. CFD and FEM
- 1.8. Aeroacoustics
 - 1.8.1. Computational aeroacoustics
 - 1.8.2. Acoustic analogies
 - 1.8.3. Resolution methods



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- 1.9. Advection-diffusion problems
 - 1.9.1. Advection-diffusion problems
 - 1.9.2. Scalar Fields
 - 1.9.3. Particle methods
 - 1.10. Coupling models with reactive flow
 - 1.10.1. Coupling models with reactive flow. Applications
 - 1.10.2. System of differential equations. Solving the chemical reaction
 - 1.10.3. CHEMKINS
 - 1.10.4. Combustion: flame, spark, Wobee
 - 1.10.5. Reactive flows in non-stationary regime: quasi-stationary system hypothesis
 - 1.10.6. Reactive flows in turbulent flows
 - 1.10.7. Catalysts

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Thanks to the most efficient pedagogical methodology, TECH Technological University Relearning, you will be able to acquire new skills and knowledge in a precise way”

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 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.

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.



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 Course on Coupling with CFD Simulations. Multiphysics applications guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.



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

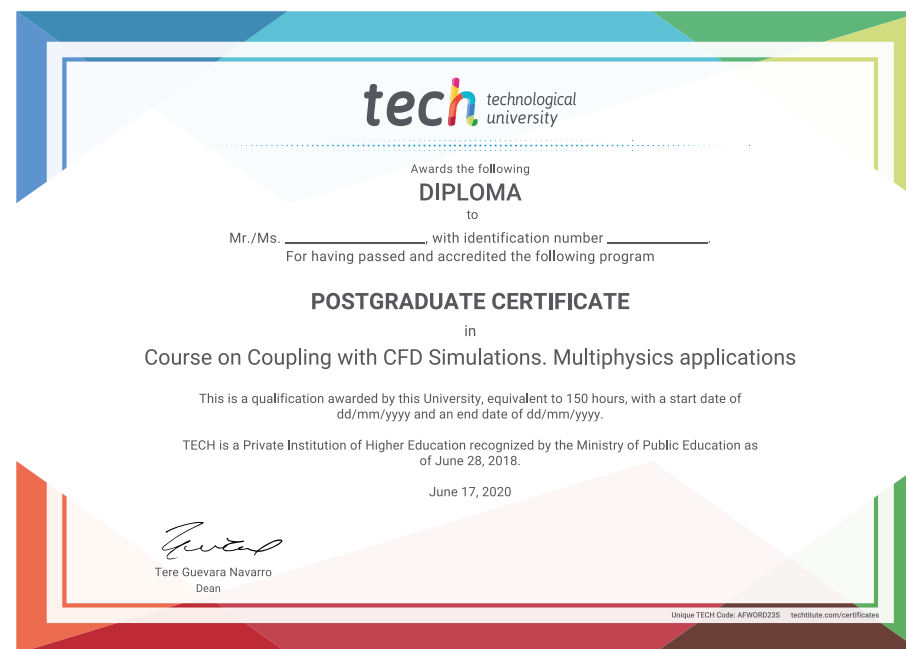
This **Postgraduate Certificate in Course on Coupling with CFD Simulations. Multiphysics applications** contains the most complete and up-to-date program on the market.

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 Postgraduate Certificate, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Certificate in Course on Coupling with CFD Simulations. Multiphysics applications**

Official N° of Hours: **150 h.**



*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.

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



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