

Postgraduate Certificate

Chance and Probability



Postgraduate Certificate Chance and Probability

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

Website: www.techtitute.com/in/engineering/postgraduate-certificate/chance-probability

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01

Introduction

The increasing complexity of systems and the enormous amount of available data make it necessary to use probabilistic techniques to make optimal choices. In that sense, decision making based on uncertainty is a very common practice in Engineering. Therefore, probability theory provides a theoretical framework for dealing with uncertainty and variability, which is essential for success. For this reason TECH presents this program as a response to the current needs of the engineer in a context in which data analysis and statistics have become essential tools for this task. Therefore, the graduate will focus their study on probabilistic models, conditional probability and random variables, among other relevant aspects under a solid 100% online format.



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You will know how to handle uncertainty situations and make optimal decisions in any engineering field thanks to TECH's Postgraduate Certificate in Chance and Probability”

According to data from the World Economic Forum's report "The Future of Jobs", skills related to data science, including statistics and probability, will be increasingly in demand in the job market in the coming years. Today, data analysis and statistics have become indispensable tools for decision making in virtually every field of engineering. Furthermore, today's systems are becoming increasingly complex, and the large amount of data available makes it necessary to use probabilistic techniques to make better choices.

It is in this context that the Postgraduate Certificate in Chance and Probability responds to the current needs of the engineer. This academic program focuses on providing students with rigorous and up-to-date education in probabilistic models, conditional probability, random variables, distributions, central limit theorem, among other relevant aspects. All of this with the objective that students acquire the skills and knowledge necessary to successfully address the challenges of an increasingly complex and changing environment.

It should be noted that the program is developed in a 100% online format and uses the Relearning methodology. This means that students can adapt the pace of learning to their needs and time availability, which is especially important for those who combine their studies with work or have other responsibilities that prevent them from attending on-site classes.

This **Postgraduate Certificate in Chance and Probability** contains the most complete and up-to-date program on the market. The most important features include:

- ♦ The development of case studies presented by Applied Statistics experts
- ♦ The graphic, schematic and eminently practical contents with which it is conceived provide sporting and practical information on those disciplines that are essential for professional practice
- ♦ Practical exercises where the self-assessment process can be carried out 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



Improve your knowledge in probability and chance with the most complete syllabus in the current digital academic panorama"

“*Delve into the central limit theorem and other important tools with TECH's comprehensive Postgraduate Certificate in Chance and Probability syllabus*”

Enroll and you will have access to the Virtual Campus 24 hours a day and a library full of first class content to catapult your professional success.

Become an expert in distributions and random variables with TECH's Postgraduate Certificate in Chance and Probability.

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.

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



02 Objectives

The use of probabilistic techniques is increasingly relevant in practically all fields of engineering, due to the complexity of current systems and the amount of information available. Therefore, the professional who completes this program will have access to the most cutting-edge knowledge in probabilistic models and random variables, distributions, among other relevant aspects. Therefore, they will acquire the necessary skills to successfully address the challenges of a sector in constant change and be more effective in their determinations. All this, in a flexible learning environment, as the program is developed in a 100% online format.



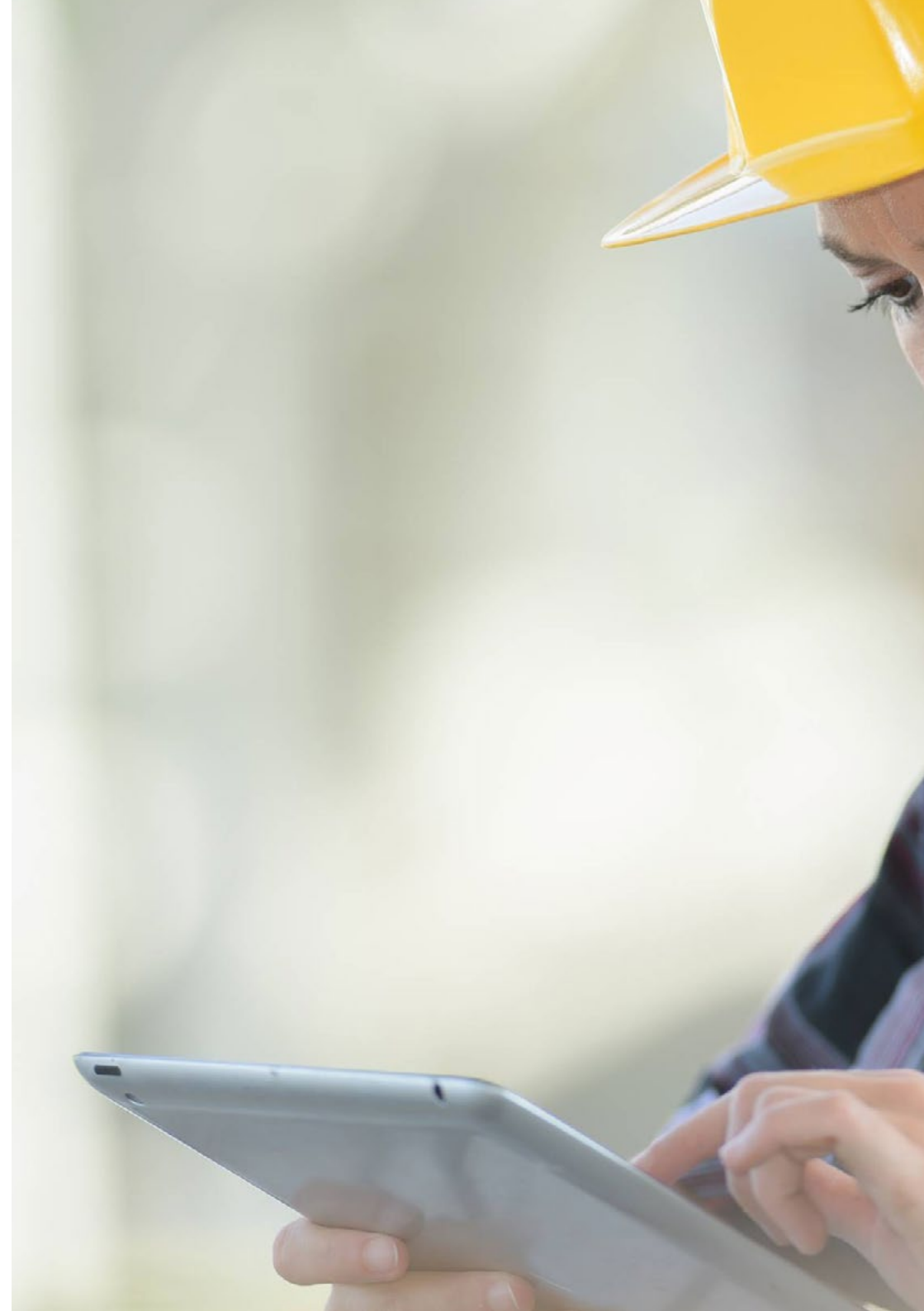
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Achieve your career goals through a rigorous and comprehensive degree that provides you with solid knowledge in probabilistic models, conditional probability, distributions and much more”



General Objectives

- ♦ Provide the graduate with the latest and most exhaustive information on Computational Statistics, which will help them to specialize in this field reaching the highest level of knowledge
- ♦ Provide them with everything necessary to acquire a professional mastery of the main tools in this field through the resolution of use cases based on real and frequent situations in the industry





Specific Objectives

- ◆ Apply the techniques of probability calculation
- ◆ Become familiar with the usual random variables
- ◆ Build elementary models
- ◆ Know how to use limit theorems (laws of large numbers and central limit theorem)

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Enroll now and acquire the skills you need to stand out in the job market and achieve professional success!”

03

Structure and Content

The main objective of the syllabus design of this program is to provide students with the necessary skills to successfully face the challenges presented by a changing and competitive environment. This way, they will be able to improve their ability to make optimal decisions in situations of uncertainty. In addition, the program is developed in a convenient and flexible 100% online format and features a large amount of didactic materials in different audiovisual supports for an elite education.



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Expand your knowledge in statistics and data analysis with the Postgraduate Certificate in Chance and Probability from TECH”

Module 1. Chance and Probability

- 1.1. Probabilistic Models
 - 1.1.1. Introduction
 - 1.1.2. Random Phenomena
 - 1.1.3. Probability Spaces
 - 1.1.4. Properties of Probability
 - 1.1.5. Combinatorial
- 1.2. Conditional Probability
 - 1.2.1. Definition of Conditional Probability
 - 1.2.2. Event Independence
 - 1.2.3. Properties of Event Independence
 - 1.2.4. The Total Probability Formula
 - 1.2.5. Bayes' Formula
- 1.3. One-Dimensional Random Variables
 - 1.3.1. Concept of One-Dimensional Random Variables
 - 1.3.2. Operations with Random Variables
 - 1.3.3. Distribution Function of a One-Dimensional Random Variable. Properties
 - 1.3.4. Discrete, Continuous and Mixed Random Variables
 - 1.3.5. Random Variables Transformation
- 1.4. Characteristics of One-Dimensional Random Variables
 - 1.4.1. Mathematical Expectation. Properties of Expectation Operators
 - 1.4.2. Moments with Respect to the Origin. Moments with Respect to the Mean
 - 1.4.3. Relations between Moments
 - 1.4.4. Measures of Position, Dispersion and Shape
 - 1.4.5. Chebyshev's Theorem
- 1.5. Discrete Distributions
 - 1.5.1. Degenerate Distribution
 - 1.5.2. Uniform Distribution on n Points
 - 1.5.3. Bernoulli's Distribution
 - 1.5.4. Binomial Distribution
 - 1.5.5. Poisson distribution
 - 1.5.6. Negative Binomial Distribution
 - 1.5.7. Geometric Distribution
 - 1.5.8. Hypergeometric Distribution





- 1.6. Normal Distribution
 - 1.6.1. Introduction
 - 1.6.2. Characteristics of Normal Distribution
 - 1.6.3. Representation of Normal Distribution
 - 1.6.4. Approximation of a Binomial by Normal Distribution
- 1.7. Other Continuous Distributions
 - 1.7.1. Uniform Distribution
 - 1.7.2. Gamma Distribution
 - 1.7.3. Exponential Distributions
 - 1.7.4. Beta Distribution
- 1.8. Two-Dimensional Random Variables
 - 1.8.1. Introduction
 - 1.8.2. Two-Dimensional Random Variables
 - 1.8.3. Discrete Two-Dimensional Random Variables. Mass Function
 - 1.8.4. Continuous Two-Dimensional Random Variables. Density Function
- 1.9. Two-Dimensional Random Variables Distributions
 - 1.9.1. Joint Distribution Function. Properties
 - 1.9.2. Marginal Distributions
 - 1.9.3. Conditional Distributions
 - 1.9.4. Independent Random Variables
- 1.10. Laws of Large Numbers and Central Limit Theorem
 - 1.10.1. Sequence of Random Variable
 - 1.10.2. Convergence of Sequences of Random Variables. Relations between the Different Types of Convergence
 - 1.10.2.1. Pointwise Convergence
 - 1.10.2.2. Almost Certain Convergence
 - 1.10.2.3. Convergence in Probability
 - 1.10.2.4. Convergence in Law or Distribution
 - 1.10.3. Large Number Laws
 - 1.10.4. Central Classical Limit Problem

04 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.





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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.

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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.



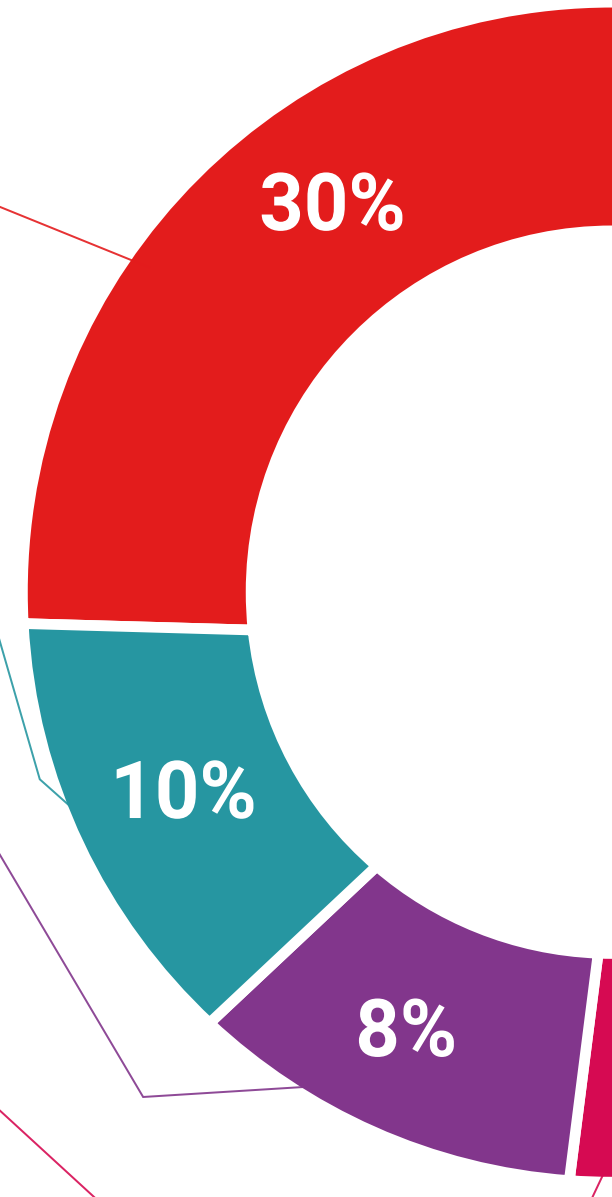
Practising Skills and Abilities

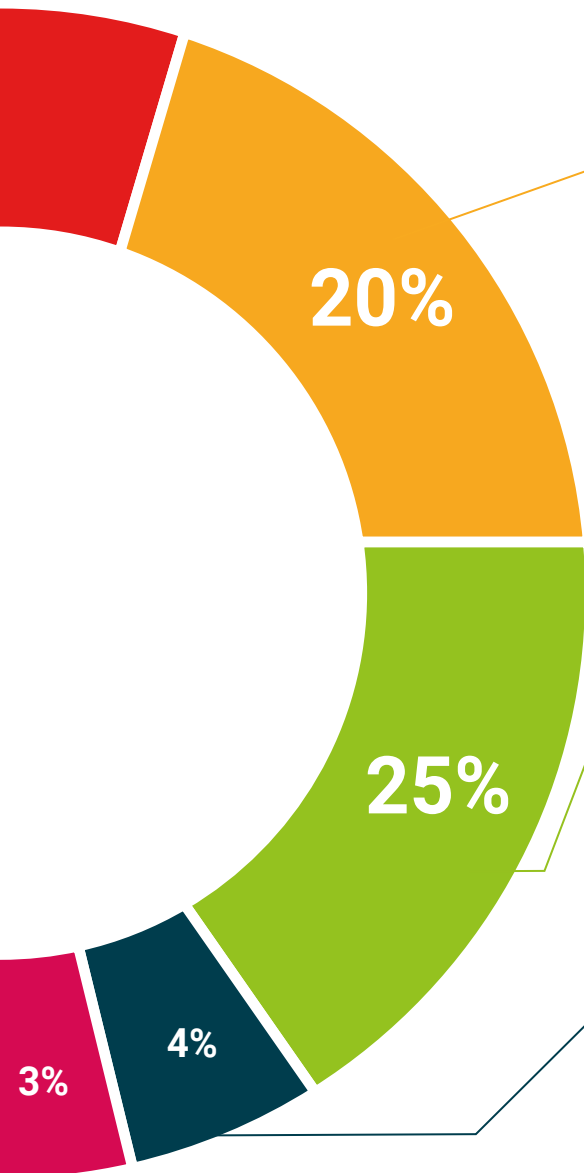
They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



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.



05 Certificate

The Postgraduate Certificate in Chance and Probability 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 Chance and Probability** 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 Chance and Probability**

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.



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