

# Postgraduate Certificate Linear Prediction Methods





## Postgraduate Certificate Linear Prediction Methods

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

Website: [www.techtitute.com/us/engineering/postgraduate-certificate/linear-prediction-methods](http://www.techtitute.com/us/engineering/postgraduate-certificate/linear-prediction-methods)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Structure and Content

---

*p. 12*

04

Methodology

---

*p. 16*

05

Certificate

---

*p. 24*

# 01

# Introduction

Linear prediction methods are an essential tool for decision making in different fields of engineering. In that sense, they allow data analysis and future projections that are key in project planning and the design of efficient solutions. Therefore, they are applied in different areas of engineering, such as mechanical, electrical, chemical, civil and many others. For this reason, TECH has developed a complete and dynamic program through which the graduate will be able to delve into the multiple linear regression model, as well as the estimation and contrasts of the same. All this through 180 hours of the best theoretical, practical and additional material presented in a convenient and flexible 100% online format.





*Take advantage of the unique opportunity for professional and personal growth offered exclusively by this TECH Postgraduate Certificate”*

Linear prediction methods have become an essential tool in decision making in different fields of engineering. This is because they allow to analyze data and make future projections that are key in project planning and design of efficient solutions. Linear prediction methods are applied in different areas of engineering, such as mechanical, electrical, chemical, civil and many others, so it is important to have a solid knowledge in this subject.

In this sense, TECH has developed a complete and dynamic university program in Linear Prediction Methods, through which the graduate will be able to delve into the multiple linear regression model, as well as its estimation and contrasts. In addition, by acquiring solid knowledge in this subject and knowing how to apply it in decision making, engineers will be able to improve efficiency and reduce costs by predicting potential problems and opportunities in the future.

This fully online program is developed over six weeks, with unlimited access to the Virtual Campus and is compatible with any device that has an Internet connection. It also includes hours of high-quality additional material presented in a variety of formats, such as detailed videos, research articles, supplementary readings, self-assessment exercises, dynamic summaries and more. All material can be downloaded for later reference, even in areas without Internet connection, and for after the highly educational and enriching academic experience is over.

This **Postgraduate Certificate in Linear Prediction Methods** 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 Applied Statistics
- ◆ 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



*You will be able to download all the content to any electronic device from the Virtual Campus and consult it whenever you need it, even without an Internet connection”*

“

*With the Relearning methodology you will acquire the knowledge in a progressive way and with total flexibility. A program that fits you”*

*Give a significant boost to your professional career by including this Postgraduate Certificate in your Resume.*

*Combine your personal and work responsibilities with your studies thanks to this Postgraduate Certificate. 100% flexible and online.*

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

Linear prediction methods are a fundamental tool in data analysis and decision making in various fields, such as economics, engineering, biology and social sciences. Therefore, professionals in the sector must remain up to date with new developments and technological advances. For this reason, TECH and its team of experts have developed this program, with the aim of guiding graduates in updating and expanding their knowledge. All this 100% online and in only 6 months of multidisciplinary education.





“

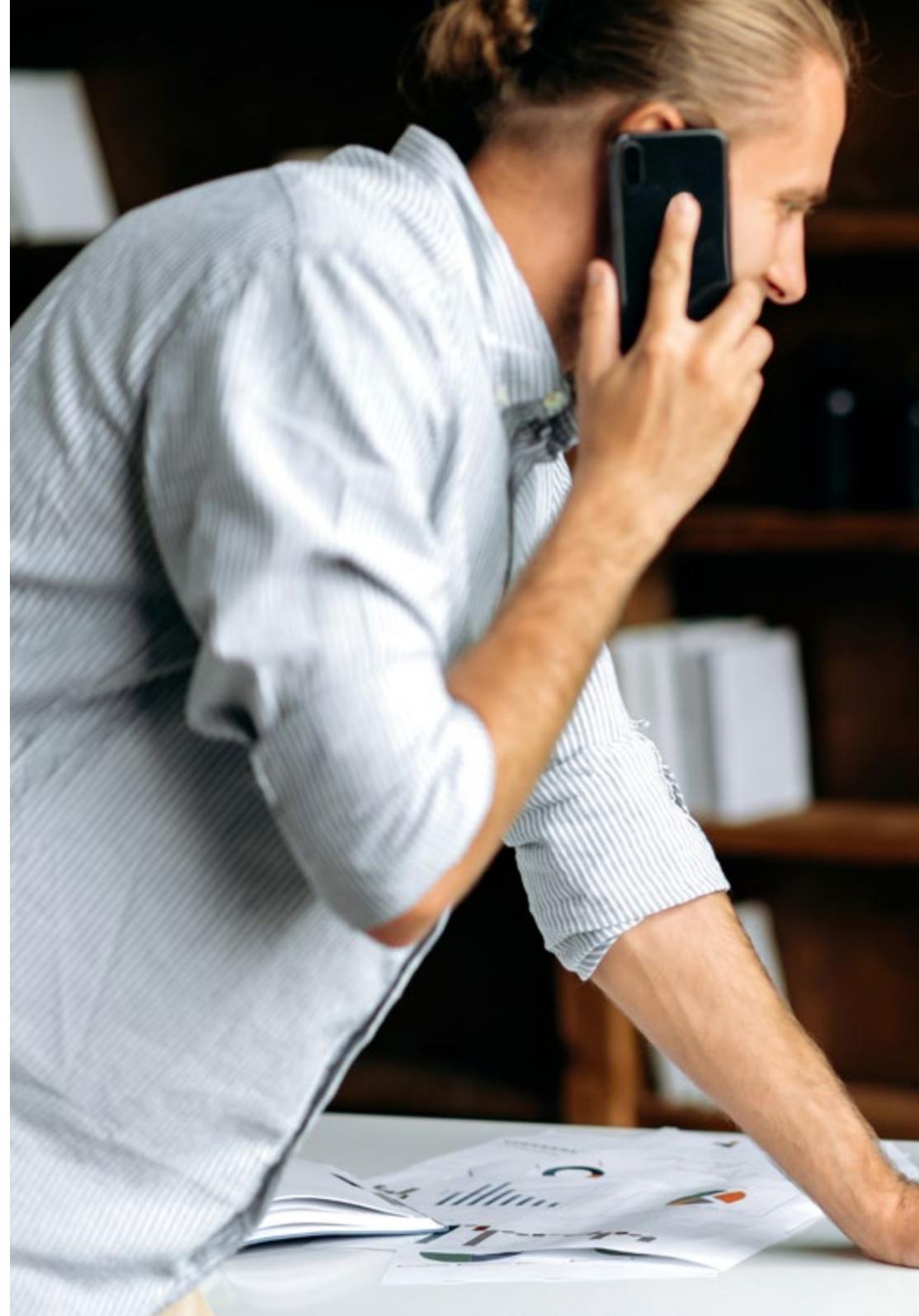
*Do you want to become an expert in Linear Prediction Methods? Now is your time, this is your program. Only with TECH”*



## 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 in the field
- ◆ 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

---

- ◆ Introduce linear models
- ◆ Study, understand and apply simple linear regression models
- ◆ Study, understand and apply multiple linear regression models

“

*Upgrade your skills to enhance your professional future. Now is always the best time”*

# 03

## Structure and Content

The syllabus that composes this academic qualification has been elaborated by experts in Applied Statistics. In this sense, they have included 180 hours of the most avant-garde theoretical-practical and additional contents, presented in different audiovisual supports. In addition, thanks to the revolutionary methodology exclusive to TECH, the Relearning, the graduate will delve into the simple linear regression model through a flexible and totally online format. Therefore, the graduate will acquire the latest tools from any device with Internet connection and with access to the virtual campus 24 hours a day.

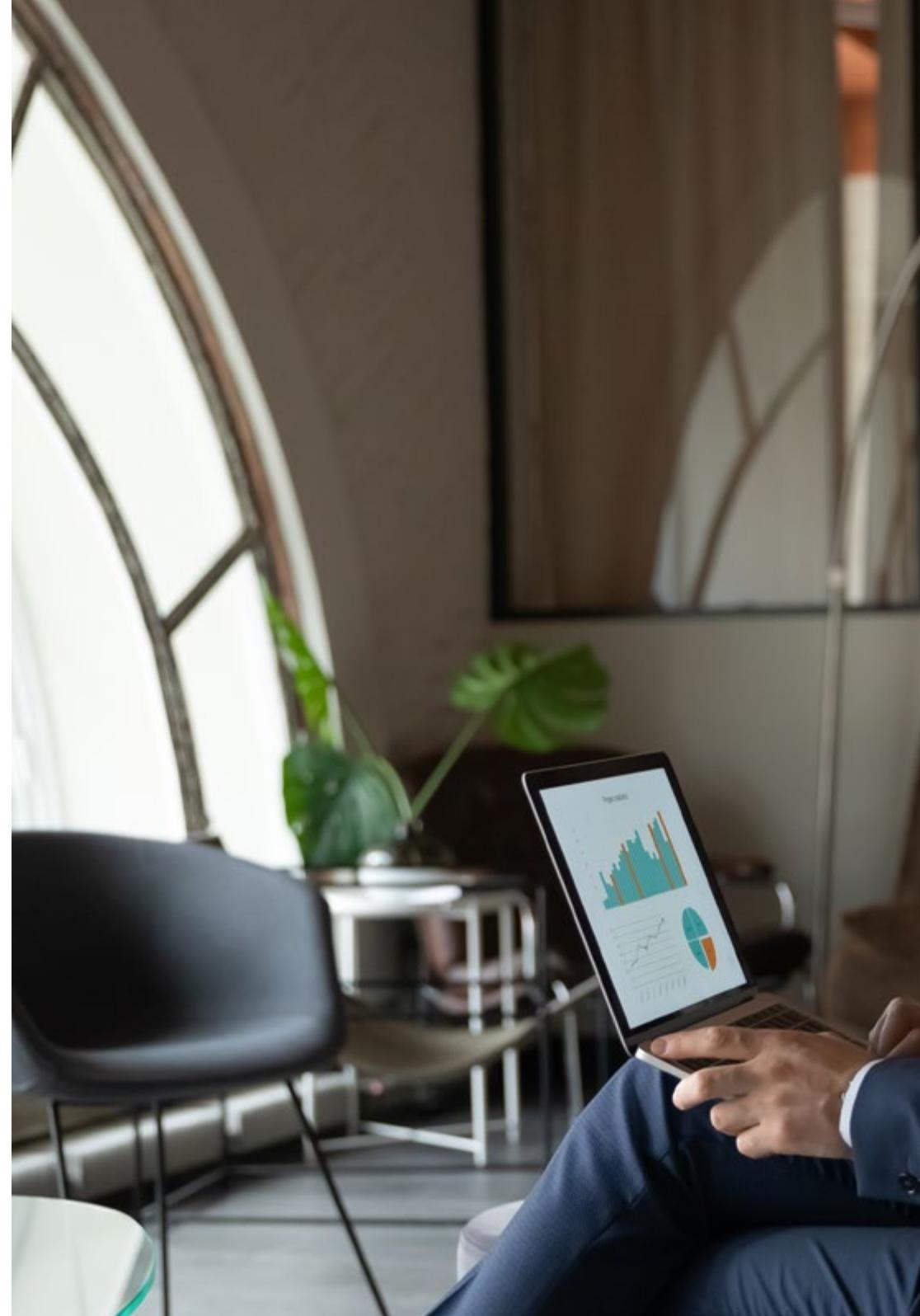


“

*After a complex production process, TECH has transformed the best contents into a multimedia format of high pedagogical and audiovisual quality”*

## Module 1. Linear Prediction Methods

- 1.1. Simple Linear Regression Models
  - 1.1.1. Introduction to Regression Models and Preliminary Steps in Simple Regression: Data Exploration
  - 1.1.2. Models
  - 1.1.3. Hypotheses
  - 1.1.4. Parameters
- 1.2. Simple Linear Regression Estimation and Contrasts
  - 1.2.1. Point Estimation of Model Parameters
    - 1.2.1.1. Least Squares Method
    - 1.2.1.2. Maximum Likelihood Estimators
  - 1.2.2. Inference on Model Parameters under the Gauss-Markov Hypothesis
    - 1.2.2.1. Intervals
    - 1.2.2.2. Test
  - 1.2.3. Confidence Interval for the Mean Response and Prediction Interval for New Observations
  - 1.2.4. Simultaneous Inferences in Simple Regression
  - 1.2.5. Confidence and Prediction Bands
- 1.3. Simple Linear Regression Models Diagnosis and Validation
  - 1.3.1. Analysis of Variance (ANOVA) of Simple Regression Models
  - 1.3.2. Model Diagnostics
    - 1.3.2.1. Graphical Assessment of Linearity and Verification of the Hypotheses by Residuals Analysis
    - 1.3.2.2. Linear Lack-of-Fit Test
- 1.4. Multiple Linear Regression Models
  - 1.4.1. Data Exploration with Multidimensional Visualization Tools
  - 1.4.2. Matrix Expression of Models and Coefficient Estimators
  - 1.4.3. Interpreting Coefficients of Multiple Models





- 1.5. Multiple Linear Regression Estimation and Contrasts
  - 1.5.1. Laws of Estimation for Coefficients, Predictions, and Residuals
  - 1.5.2. Applying Properties of Idempotent Matrices
  - 1.5.3. Inference in Multiple Linear Models
  - 1.5.4. Anova Models
- 1.6. Multiple Linear Regression Models Diagnosis and Validation
  - 1.6.1. “Ligatures” Test to Solve Linear Constraints on Coefficients
    - 1.6.1.1. The Principle of Incremental Variability
  - 1.6.2. Waste Analysis
  - 1.6.3. Box-Cox Transformation
- 1.7. The Problem of Multicollinearity
  - 1.7.1. Detection
  - 1.7.2. Solutions
- 1.8. Polynomial Regression
  - 1.8.1. Definition and Example
  - 1.8.2. Matrix Form and Calculating Estimates
  - 1.8.3. Interpretation
  - 1.8.4. Alternative Approaches
- 1.9. Regression with Qualitative Variables
  - 1.9.1. Dummy Variables in Regression
  - 1.9.2. Interpreting Coefficients
  - 1.9.3. Applications
- 1.10. Criteria for Models Selection
  - 1.10.1. Mallows Cp Statistics
  - 1.10.2. Model Cross Validation
  - 1.10.3. Automatic Stepwise Selection

# 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.





“

*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.



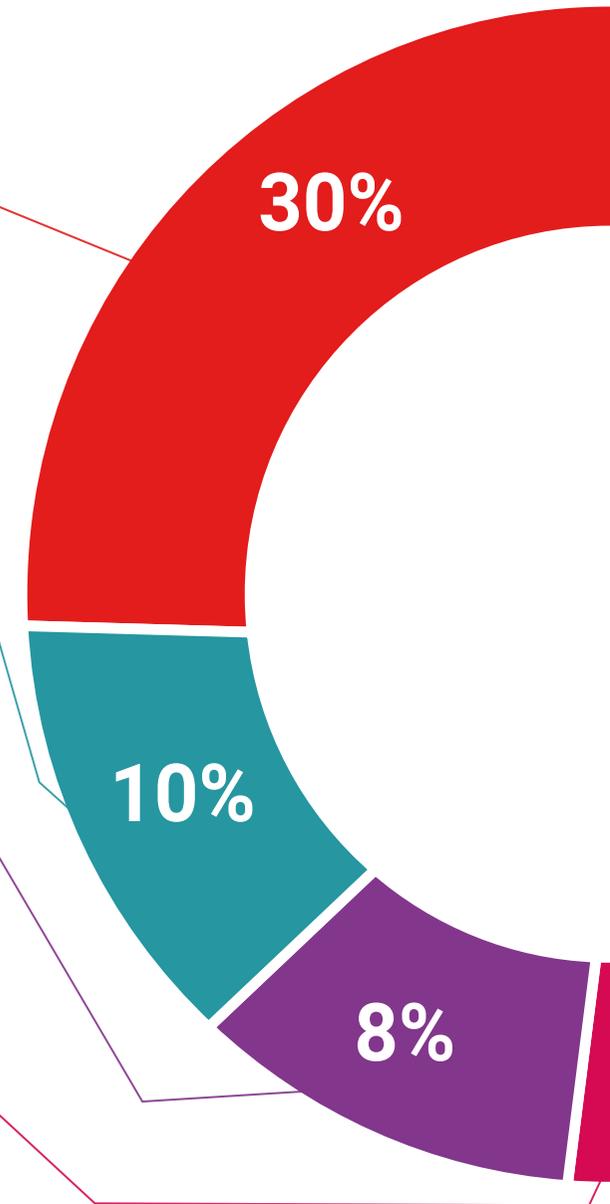
### Practising Skills and Abilities

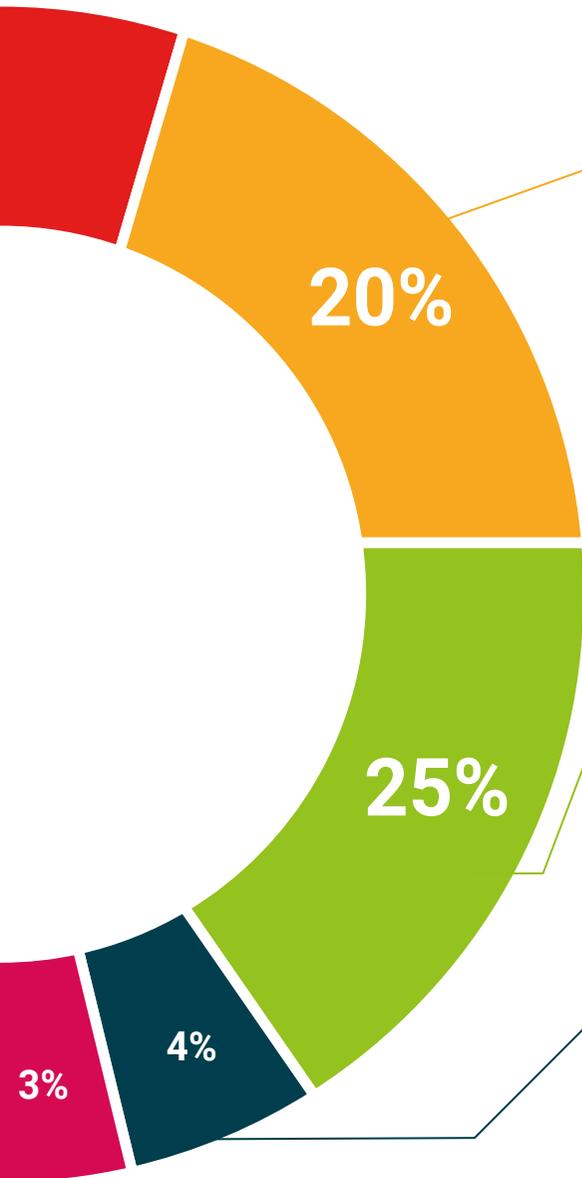
They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



### 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.



05

# Certificate

The Postgraduate Certificate in Linear Prediction Methods 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 program will allow you to obtain your **Postgraduate Certificate in Linear Prediction Methods** 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** title 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 Linear Prediction Methods**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



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 Linear Prediction Methods

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

# Postgraduate Certificate Linear Prediction Methods

