

# Postgraduate Diploma Multivariate Techniques



## Postgraduate Diploma Multivariate Techniques

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

Website: [www.techtitute.com/us/engineering/postgraduate-diploma/postgraduate-diploma-multivariate-techniques](http://www.techtitute.com/us/engineering/postgraduate-diploma/postgraduate-diploma-multivariate-techniques)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Structure and Content

---

*p. 12*

04

Methodology

---

*p. 18*

05

Certificate

---

*p. 26*

# 01

# Introduction

Multivariate Analysis and the set of techniques that this activity encompasses allows professionals of Applied Statistics to extract abundant information from the data that is available. It is a complex source that requires exhaustive and deep knowledge of its fundamentals to be able to get the maximum performance and conscientiously establish the degree of relationship that exists between the variation of the intervening factors. For this reason, TECH has developed a complete and dynamic program through which the graduate will be able to delve into the currently existing techniques, as well as advanced prediction strategies through different types of regression. All of the above across 450 hours of the best theoretical, practical and additional material presented in a comfortable and flexible 100% online format.



“

*Would you like to master the most advanced multivariate statistical prediction techniques and don't have time to access face-to-face education? TECH puts the best 100% online program at your disposal to achieve it”*

Thanks to the development of multivariate techniques, nowadays it is possible to define the level of relationship that exists between the variation of different weighted and/or combined factors with a very high degree of accuracy. Based on this, researchers can extract relevant information on the available data, allowing them to establish guidelines for action and more accurate and effective intervention strategies for the future of the project they are working on: social trends, economic regressions, political results, etc. It is a discipline that, due to its complexity, requires of a wide and exhaustive knowledge about its extensions and distributions, something the graduate will be able to work with throughout this program.

TECH presents the Postgraduate Diploma in Multivariate Techniques as a unique opportunity so that the student can specialize in this area through an innovative, complete and exhaustive educational experience. The program includes 450 hours of theoretical, practical and additional content that will enable you to delve into the statistical techniques of factor analysis and principal component modeling, as well as in the discriminant study and in the hierarchical and non-hierarchical algorithms. Also, the program will delve into the advanced principles of prediction, focusing its study on the properties of their strategies, as well as recommendations for their use.

All of the above in a 100% online format and through a program that includes, in addition to the agenda, use cases to improve students skills in a practical way, as well as detailed videos, research articles, additional reading, news and much more additional material to delve into the different sections of the curriculum. All of this will be available on the Virtual Campus from the very start and can be downloaded to any device with an Internet connection, such as a PC, Tablet or mobile phone.

This **Postgraduate Diploma in Multivariate Techniques** 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 the program is designed to collect technical 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 for 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 work conscientiously in the stratified analysis in 2x2 tables through the most innovative techniques and strategies”*

“

*You will have the most exhaustive and innovative educational material, made up of detailed videos, research articles, news, additional reading and much more!”*

In its teaching staff, the program includes professionals from the sector who pour the experience of their work into this program, in addition to recognized specialists from reference 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.

This program's design focuses on Problem-Based Learning, through which the professional must try to solve different professional practice situations that are raised throughout the year. This will be done with the help of an innovative system of interactive videos made by renowned experts.

*The perfect program to get up to date on problem formulation programs in loglinear models from wherever you want, and with a format adapted to your needs.*

*You will have numerous use cases with which you can put your skills in the classification of individuals and the formulation of problems into practice.*



# 02

# Objectives

TECH designs each of its educational experiences with the needs of all of its graduates in mind. For this reason, this program aims to provide all the content that the student needs to specialize in the area of statistical studies, more specifically the one pertaining to multivariate and regression techniques. In this way, students will be able to include the exhaustive mastery of the main analysis tools and modeling amongst their skills, and develop the professional skills of a true Postgraduate Diploma.





“

*You will work with multiple examples of cluster analysis modeling, so that you can better visualize the process through the main statistical software”*



## General Objectives

---

- ◆ Implement the most innovative, complex and exhaustive multivariate statistical techniques to the graduate's practice
- ◆ Develop broad and specialized knowledge about factor analysis modeling through the use of the best statistical software
- ◆ Know the advanced prediction techniques in detail and their multiple applications in the regression of statistical data

“

*A unique opportunity to implement the most innovative saturated modeling strategies in your practice and achieve your professional goals in less than 6 months”*





## Specific Objectives

---

### Module 1. Multivariate Statistical Techniques I

- ◆ Study and determine the true dimension of multivariate information
- ◆ Relate qualitative variables
- ◆ Classify individuals into previously established groups based on multivariate information
- ◆ Form groups of individuals with similar features

### Module 2. Multivariate Statistical Techniques II

- ◆ Acquire the conceptual and practical fundamentals to conduct multivariate qualitative data analysis
- ◆ Apply specific software to solve each of these problems

### Module 3. Advanced Prediction Techniques

- ◆ Understand and apply specific prediction methods for one or more variables in situations where traditional methods present problems of a theoretical nature
- ◆ Know the different regression processes used in prediction

# 03

## Structure and Content

For the development of this Postgraduate Diploma, TECH has taken into consideration the criteria of a team of professionals versed in Applied Statistics, more specifically in the area of studies and research. Because of this, it has been possible to develop a dynamic and multidisciplinary study plan that is also complete and innovative, with which the graduate will be able to acquire unique knowledge about advanced forecasting techniques, as well as about different multivariate strategies. All this 100% online and through a degree fully adapted to the forefront of the university environment.



“

*You will find detailed videos, research articles, complementary readings and much more in the Virtual CAMPUS! So you can personalize your study of the different sections of the syllabus”*

## Module 1. Multivariate Statistical Techniques I

- 1.1. Factor Analysis
  - 1.1.1. Introduction
  - 1.1.2. Fundamentals of Factor Analysis
  - 1.1.3. Factor Analysis
  - 1.1.4. Factor Rotation Methods and Factor Analysis Interpretation
- 1.2. Factor Analysis Modeling
  - 1.2.1. Examples
  - 1.2.2. Statistical Software Modeling
- 1.3. Main Component Analysis
  - 1.3.1. Introduction
  - 1.3.2. Main Component Analysis
  - 1.3.3. Systematic Principal Component Analysis
- 1.4. Principal Component Analysis Modeling
  - 1.4.1. Examples
  - 1.4.2. Statistical Software Modeling
- 1.5. Correspondence Analysis
  - 1.5.1. Introduction
  - 1.5.2. Independence Test
  - 1.5.3. Row and Column Profiles
  - 1.5.4. Inertia Analysis of a Point Cloud
  - 1.5.5. Multiple Correspondence Analysis
- 1.6. Correspondence Analysis Modeling
  - 1.6.1. Examples
  - 1.6.2. Statistical Software Modeling
- 1.7. Discriminant Analysis
  - 1.7.1. Introduction
  - 1.7.2. Decision Rules for Two Groups
  - 1.7.3. Classification over Several Populations
  - 1.7.4. Fisher's Canonical Discriminant Analysis
  - 1.7.5. Selecting Variables: Forward and Backward Procedure
  - 1.7.6. Systematic Discriminant Analysis
- 1.8. Discriminant Analysis Modeling
  - 1.8.1. Examples
  - 1.8.2. Statistical Software Modeling
- 1.9. Cluster Analysis
  - 1.9.1. Introduction
  - 1.9.2. Distance and Similarity Measures
  - 1.9.3. Hierarchical Classification Algorithms
  - 1.9.4. Non-Hierarchical Classification Algorithms
  - 1.9.5. Procedures to Determine the Appropriate Number of Clusters
  - 1.9.6. Characterization of Clusters
  - 1.9.7. Systematic Cluster Analysis
- 1.10. Cluster Analysis Modeling
  - 1.10.1. Examples
  - 1.10.2. Statistical Software Modeling

**Module 2. Multivariate Statistical Techniques II**

- 2.1. Introduction
- 2.2. Nominal Scale
  - 2.2.1. Measures of Association for 2x2 Tables
    - 2.2.1.1. Phi Coefficient
    - 2.2.1.2. Relative Risk
    - 2.2.1.3. Cross-Product Ratio (Odds Ratio)
  - 2.2.2. Measures of Association for IxJ Tables
    - 2.2.2.1. Contingency Ratio
    - 2.2.2.2. Cramer's V
    - 2.2.2.3. Lambdas
    - 2.2.2.4. Tau of Goodman and Kruskal
    - 2.2.2.5. Uncertainty Coefficient
  - 2.2.3. Kappa Coefficient
- 2.3. Ordinal Scale
  - 2.3.1. Gamma Coefficients
  - 2.3.2. Kendall's Tau-B and Tau-C
  - 2.3.3. Sommers' D
- 2.4. Interval or Ratio Scale
  - 2.4.1. Eta Coefficient
  - 2.4.2. Pearson's and Spearman's Correlation Coefficients
- 2.5. Stratified Analysis in 2x2 Tables
  - 2.5.1. Stratified Analysis
  - 2.5.2. Stratified Analysis in 2x2 Tables
- 2.6. Problem Formulation in Log-linear Models
  - 2.6.1. The Saturated Model for Two Variables
  - 2.6.2. The General Saturated Model
  - 2.6.3. Other Types of Models
- 2.7. The Saturated Model
  - 2.7.1. Calculation of Effects
  - 2.7.2. Goodness of Fit
  - 2.7.3. Test of K effects
  - 2.7.4. Partial Association Test
- 2.8. The Hierarchical Model
  - 2.8.1. Backward Methods
- 2.9. Probit Response Models
  - 2.9.1. Problem Formulation
  - 2.9.2. Parameter Estimation
  - 2.9.3. Chi-Square Goodness-of-Fit Test
  - 2.9.4. Parallelism Test for Groups
  - 2.9.5. Estimation of the Dose Required to Obtain a Given Response Ratio
- 2.10. Binary Logistic Regression
  - 2.10.1. Problem Formulation
  - 2.10.2. Qualitative Variables in Logistic Regression
  - 2.10.3. Selection of Variables
  - 2.10.4. Parameter Estimation
  - 2.10.5. Goodness of Fit
  - 2.10.6. Classification of Individuals
  - 2.10.7. Prediction

### Module 3. Advanced Prediction Techniques

- 3.1. General Linear Regression Model
  - 3.1.1. Definition
  - 3.1.2. Properties
  - 3.1.3. Examples
- 3.2. Partial Least Squares Regression
  - 3.2.1. Definition
  - 3.2.2. Properties
  - 3.2.3. Examples
- 3.3. Principal Component Regression
  - 3.3.1. Definition
  - 3.3.2. Properties
  - 3.3.3. Examples
- 3.4. RRR Regression
  - 3.4.1. Definition
  - 3.4.2. Properties
  - 3.4.3. Examples
- 3.5. Ridge Regression
  - 3.5.1. Definition
  - 3.5.2. Properties
  - 3.5.3. Examples
- 3.6. Lasso Regression
  - 3.6.1. Definition
  - 3.6.2. Properties
  - 3.6.3. Examples
- 3.7. Elasticnet Regression
  - 3.7.1. Definition
  - 3.7.2. Properties
  - 3.7.3. Examples





- 3.8. Non-Linear Prediction Models
  - 3.8.1. Non-Linear Regression Models.
  - 3.8.2. Non-Linear Least Squares
  - 3.8.3. Conversion to a Linear Model
- 3.9. Parameter Estimation in a Non-Linear System
  - 3.9.1. Linearization
  - 3.9.2. Other Parameter Estimation Methods
  - 3.9.3. Initial Values
  - 3.9.4. Computer Programs
- 3.10. Statistical Inference in Non-Linear Regression
  - 3.10.1. Statistical Inference in Non-Linear La Regression
  - 3.10.2. Approximate Inference Validation
  - 3.10.3. Examples

“

*Do not think twice and choose an educational experience of the highest level and endorsed by one of the largest online universities in the world”*

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 Diploma in Multivariate Technique guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Technological University.



“

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

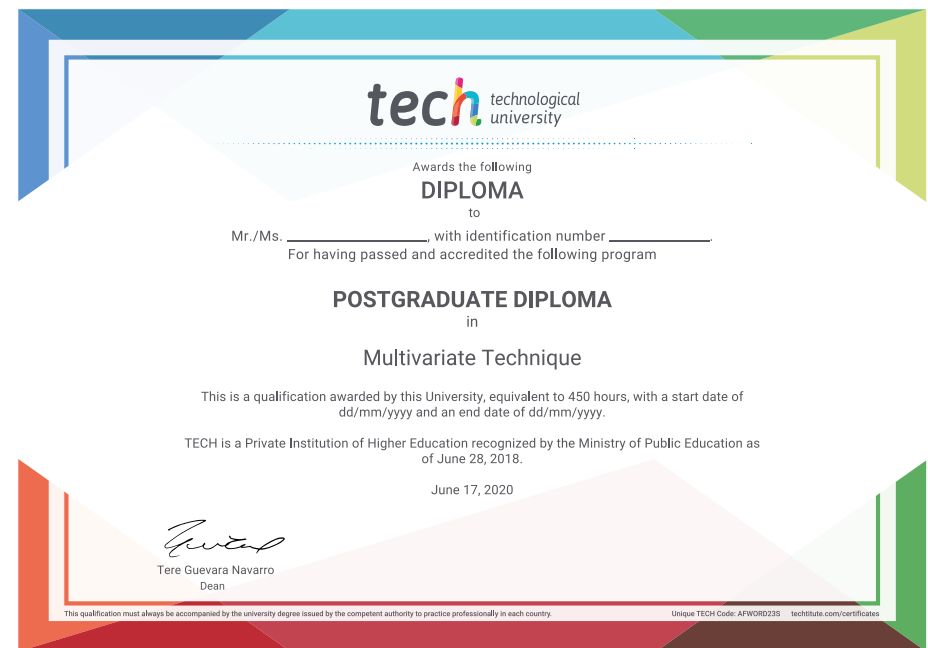
This **Postgraduate Diploma in Multivariate Techniques** contains the most complete and updated educational program on the market.

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

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

Title: **Postgraduate Diploma in Multivariate Technique**

Official N° of Hours: **450 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 quality  
development language  
virtual classroom



## Postgraduate Diploma Multivariate Techniques

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

# Postgraduate Diploma Multivariate Techniques

