

# Professional Master's Degree Statistics Applied to Economics



## Professional Master's Degree Statistics Applied to Economics

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtitute.com/in/engineering/professional-master-degree/master-statistics-applied-economics](http://www.techtitute.com/in/engineering/professional-master-degree/master-statistics-applied-economics)

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# 01

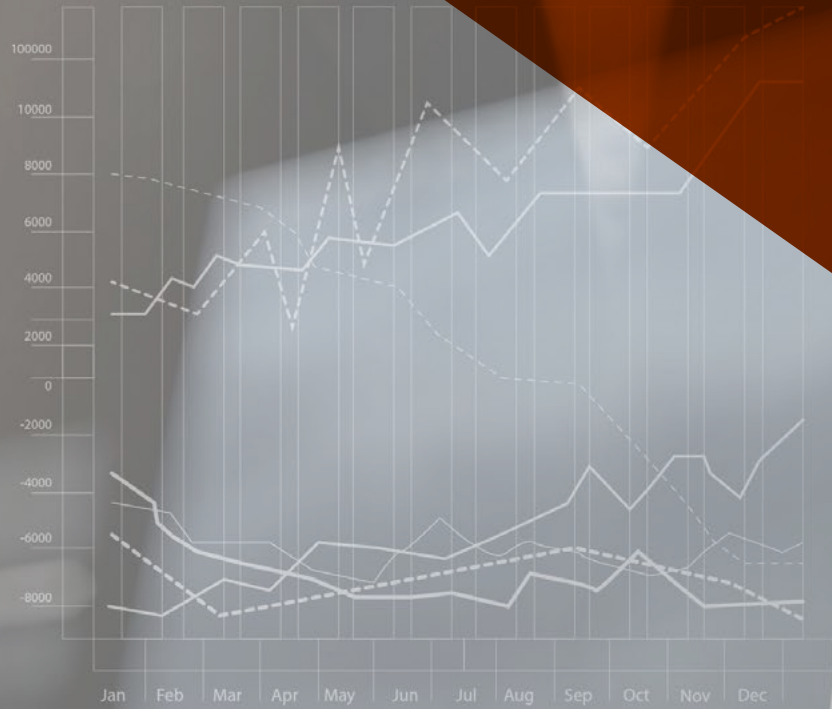
# Introduction

Statistics is a valuable tool for today's business industry. Thanks to the development of technology, it is now possible to obtain large amounts of data on social, political and economic behaviors and trends, allowing entities to establish future predictions that determine their patterns of action based on the most effective and efficient strategies to increase profitability or get as close as possible to their objectives. It is, therefore, a discipline that, if handled properly, can open many doors to its professionals in the current work environment. This 100% online program will allow you to specialize in Statistics Applied to Economics, acquiring an exhaustive handling of the main sources and techniques for collecting information and markets. To do so, students will have 1,500 hours of theoretical-practical and multidisciplinary material that will elevate their talent to the highest level.



Innovation  
Branding  
Solution  
Marketing  
Analysis  
Ideas  
Success  
Management





Innovation  
Branding  
Solution  
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Analysis  
Ideas  
Success  
Management

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*Are you looking for a program with which to specialize in Statistics applied to Economics and do not have time to attend classes in person? You have before you the perfect opportunity to get it 100% online!"*



The digital revolution and the development of technology, especially in the web, have favored the creation of an environment in which practically all user behaviors are measurable. Through the massive storage of information extracted from pages and applications, it is now possible to determine social, political and economic trends with a very high level of predictability, based on registration indicators and data created when a specific action is carried out (clicking on an ad, buying a product, unsubscribing from a service, etc.). Thanks to the application of statistics as an analytical and management discipline, information is organized and described in order to be able to apply it to future estimates with the minimum possible margin of error.

However, it is a science that has advanced considerably in recent years based on the implementation of increasingly complex, sophisticated and specialized tools for the massive processing of references. For this reason, TECH has considered it necessary to develop a program that allows students to specialize in this field through an academic experience, not only adapted to their needs, but also to the demands of the current labor sector. This is how the Professional Master's Degree in Statistics Applied to Economics arises, a comprehensive and multidisciplinary degree through which you can delve into the latest developments in this discipline.

Through 1,500 hours of theoretical-practical and additional content, the professional will learn in detail the basic concepts related to statistical indexes and their properties, as well as the main sources and techniques for collecting social and market information used in the current economic environment. They will also learn about the most important databases, their design, and the most effective study and debugging strategies for their management and handling. In addition, you will be able to work on acquiring the necessary skills to master the main statistical software for commercial and financial research. All this 100% online and through 12 months in which you will be able to access the Virtual Campus and the entire content of the program from any device with an Internet connection. It is, therefore, a unique opportunity to specialize in an ever-growing field through a cutting-edge academic experience, without schedules or on-site classes.

This **Professional Master's Degree in Statistics Applied to Economics** 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 practical contents of the book provide 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 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



*A program at the forefront of Economic Statistics that includes 1,500 hours of diverse content: from the best syllabus, to use cases and additional multidisciplinary material"*

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*Would you like to learn HTML and regular expressions for web programming? With this program you will acquire the necessary knowledge to perfectly handle CSS attributes and their codes"*

*A Professional Master's Degree that will provide you with everything you need to perfectly handle the main techniques of data collection and storage of web pages.*

*You will be able to get up to date on current databases, as well as the most effective and sophisticated design and management strategies.*

ts teaching staff includes a team of professionals from the sector who bring their work experience to this program, in addition to recognized specialists from leading societies and 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 importance of Statistics in the current economic environment has led it to become an indispensable tool for the optimal development of markets and entities. For this reason, and in view of the advances that have been made in this science, TECH has decided to launch a program that allows the graduate to delve into its novelties and specialize in the mastery of its strategies and software. For that reason, the objective of this Professional Master's Degree is to provide you with all the material you need to achieve that end through a cutting-edge and intensive academic experience that will elevate your talent to the top of the industry.







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*If your objectives include mastering the different regression models (panel, spatial or quantitative regression), this Professional Master's Degree is perfect for you. What are you waiting for to enroll?"*



## General Objectives

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- ◆ Apply their knowledge to their work or vocation in a professional manner and possess the skills that are usually demonstrated through the development and defense of arguments and problem solving within their area of study
- ◆ Perform basic operations related to information debugging
- ◆ Use the appropriate sources of information for each type of applied study
- ◆ Describe the main sources of aggregate output growth of an economy in the long run
- ◆ Calculate and use elasticities and cost-of-living indexes



*TECH's goal with this program is for you to achieve your own goals with its syllabus. For that reason, in this Professional Master's Degree you will find all the resources you need to achieve it in less than 12 months"*



## Specific Objectives

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### Module 1. Economic Statistics

- ◆ Study, understand and apply specific methods for the study of the time evolution of a magnitude, such as variation indexes and classical time series analysis

### Module 2. Sources and Techniques for Collecting Social and Market Information

- ◆ Sensitize participants to the importance of commercial research on tactical and strategic decision making in companies and organizations in general
- ◆ Stimulate critical thinking and self-reflection on the content of the program
- ◆ Understand and critically evaluate surveys as a social research technique, and to develop the necessary skills to design, implement and analyze surveys
- ◆ Make a good selection of information

### Module 3. Databases: Design and Management

- ◆ Understand computer algorithms used to manage databases and SQL language
- ◆ Critically evaluate the work performed using quality criteria
- ◆ Manage a database
- ◆ Correctly identify types of data and measures
- ◆ Identify the advantages and disadvantages of the Internet as an important source of statistical information
- ◆ Possess and understand the knowledge in an area of study that builds on the foundation of general Secondary Education, and is usually at a level that, while relying on advanced textbooks, also includes some aspects that involve knowledge from the cutting edge of their field of study

**Module 4. Data Analysis and Debugging**

- ◆ Define what Exploratory Data Analysis (EDA) is and what its objectives are
- ◆ Indicate the steps to be followed in conducting an EDA
- ◆ Select the appropriate graphical and numerical methods for examining data characteristics and/or relationships of interest
- ◆ Check if some hypotheses of interest are verified in the data (normality, linearity, homoscedasticity)
- ◆ Identify univariate, bivariate and multivariate outliers
- ◆ Understand the different types of missing data and assess their potential impact

**Module 5. Statistical System and Economic Indicators**

- ◆ Describe and analyze the elements on which both the consumer's and the producer's choice depends
- ◆ Calculate the market equilibrium of a good and its changes in response to shifts in the supply and demand curves
- ◆ Describe the agents and characteristics of a perfectly competitive market, and calculate the equilibrium
- ◆ List the characteristics of the financial system and the agents and institutions that form it
- ◆ Explain the concept of macroeconomic equilibrium and its properties using the aggregate supply and demand model

**Module 6. Statistical Software**

- ◆ Know the R environment
- ◆ Be able to develop a statistical program in R
- ◆ Know the different types of functions used by R
- ◆ Use R to help in the reflection and conclusion of statistical data

**Module 7. Commercial Research and Market Analysis: Procedures and Applications**

- ◆ Delve into the fundamentals of market research and the concept of marketing
- ◆ Know in detail the different types of marketing research

**Module 8. Multivariate Statistical Techniques**

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

**Module 9. Econometric Methods in Economics and Finance**

- ◆ Develop analysis and empirical studies in Economics
- ◆ Explain, diagnose and make forecasts on the situation of the main economic and financial variables
- ◆ Review the main sources of statistical information in economics through the Internet
- ◆ Identify the most appropriate econometric technique for the quantitative study of Economics
- ◆ Perform the application and practice in the specific R software for econometric analysis

**Module 10. Survey Segmentation and Processing Techniques**

- ◆ Acquire the necessary resources and skills to obtain, process and interpret data in various fields of science and especially in those in which information is collected by means of surveys
- ◆ Learn to analyze qualitative data from surveys, univariate, bivariate and multivariate

# 03 Skills

The syllabus of this Professional Master's Degree in Statistics Applied to Economics has been designed in such a way that, once all of its criteria have been met, the graduates will have mastered a series of professional competencies that will raise their profile to the highest level. Thanks to this program, you will be able to perfectly handle segmentation and survey processing techniques, as well as the most innovative and effective econometric methods in Economics and Finance, among other skills. In addition, you will acquire an exhaustive handling of the statistical tools and software of the R environment in Script mode and in the console of the main digital contexts.



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*A Professional Master's Degree with which you will be able to master the necessary skills to critically evaluate the work carried out in the field of digital statistics with quality criteria"*





## General Skills

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- ◆ Master the fundamental theoretical and practical aspects of Statistics Applied to Economics
- ◆ Develop an exhaustive handling of the main tools of this sector, as well as to know in detail the advantages and disadvantages of use depending on the situation
- ◆ Determine the main strategies for the contingency study by means of specialized correspondence analysis in the statistical, economic and financial fields

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*Through the resolution of use cases based on real statistical situations, you will be able to improve your skills in data processing and effective data storage”*





## Specific Skills

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- ◆ Develop a broad and specialized knowledge of Economic Statistics and its importance in today's industrial market
- ◆ Know in detail the main sources and techniques for collecting social and market information
- ◆ Perfectly command the main economic and statistical databases, as well as the most widely used information systems in the field
- ◆ Implement in their professional practice the most effective and efficient strategies of study and data cleaning in the current environment
- ◆ Master the main statistical systems, as well as the economic indicators of macroeconomics
- ◆ Introduce the use of objects in R, and to Script mode for console environments
- ◆ Determine the main commercial research and market analysis strategies through a thorough knowledge of their procedures and applications
- ◆ Master the use of stratified analysis in 2x2 tables, as well as the formulation of problems in log-linear models
- ◆ Delve into econometric methods in Economics and Finance, as well as models with cross-sectional data for their application in the statistical field
- ◆ Detailed knowledge of segmentation and survey processing techniques for use in today's commercial and industrial environment

# 04

# Structure and Content

For the development of the structure and content of this program, TECH has taken into account the professional criteria of a group of experts in Economics and Statistics, who have been responsible for compiling all the information that composes the syllabus, as well as the various additional material that accompanies the program. In this way, the graduate will have access to the highest quality theoretical-practical and multidisciplinary content, guaranteeing an exhaustive specialization in less than 12 months. In addition, the main feature of this Professional Master's Degree is its convenient and flexible online format, thanks to which you will have access to the highest level of education without restricted schedules or face-to-face classes.





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*A flexible and cutting-edge program that gives you the possibility to connect from wherever you want and whenever you want, through any device with Internet connection, whether it is a PC, tablet or cell phone”*

## Module 1. Economic Statistics

- 1.1. Introduction
  - 1.1.1. Definition and Variations Indexes
  - 1.1.2. Usefulness of Variation Indexes
- 1.2. Classification of Indexes
  - 1.2.1. Simple Indexes
  - 1.2.2. Composite Indexes
- 1.3. Simple Indexes
  - 1.3.1. Rates of Change
- 1.4. Unweighted Composite Indexes
  - 1.4.1. Definition
  - 1.4.2. Properties
- 1.5. Weighted Composite Indexes
  - 1.5.1. Laspeyres Indexes
  - 1.5.2. Paasche Indexes
  - 1.5.3. Edgeworth Indexes
  - 1.5.4. Fisher Indexes
- 1.6. Value Indexes
  - 1.6.1. Definition
  - 1.6.2. Properties
- 1.7. Index Properties
  - 1.7.1. Main Properties
  - 1.7.2. Applications
- 1.8. Operations with Indexes
  - 1.8.1. Renovation
  - 1.8.2. Liaison
  - 1.8.3. Change of Base
- 1.9. Chained Indexes
  - 1.9.1. The Chained Laspeyres Volume Index
- 1.10. Series Valuation
  - 1.10.1. Deflation of Economic Series

## Module 2. Sources and Techniques for Gathering Social and Market Information

- 2.1. Concept of Social and Market Research
  - 2.1.1. Definition
  - 2.1.2. Qualities
  - 2.1.3. Role of Social and Market Research
- 2.2. Social and Market Research
  - 2.2.1. Objectives
  - 2.2.2. Scope
  - 2.2.3. Planning
  - 2.2.4. Design
- 2.3. Information Sources
  - 2.3.1. Concept
  - 2.3.2. Types of Information Sources
  - 2.3.3. Secondary Sources
  - 2.3.4. Primary Sources
- 2.4. Search Strategies, Measurement of Information Sources and Evaluation
  - 2.4.1. Type of Strategies
  - 2.4.2. Selection of Information
  - 2.4.3. Assessment of Information
- 2.5. Information Collection Methods and Techniques
  - 2.5.1. Methodological Processes
    - 2.5.1.1. Initial Approach
    - 2.5.1.2. Research Planning
    - 2.5.1.3. Data Collection
    - 2.5.1.4. Analysis of Results
    - 2.5.1.5. Creating a Report
  - 2.5.2. Projective Techniques
  - 2.5.3. Observation
  - 2.5.4. Pseudo-Shopping or Mystery Shopping



- 2.6. The Impact of New Information Gathering Techniques and Their Specific Supports
  - 2.6.1. Survey
  - 2.6.2. Panels
  - 2.6.3. Observation
  - 2.6.4. Questionnaire and Collection Protocols
- 2.7. Qualitative Methods for Obtaining Information
  - 2.7.1. Survey Characteristics
  - 2.7.2. Types of Surveys
  - 2.7.3. Questionnaire Design
  - 2.7.4. Questionnaire Structure and Sequence
- 2.8. Field Work
  - 2.8.1. Fieldwork Planning
  - 2.8.2. Sequential Process of Data Collection
  - 2.8.3. Methods
    - 2.8.3.1. Quantitative
    - 2.8.3.2. Non-Quantitative
  - 2.8.4. Evaluation of Field Work
- 2.9. Sampling in Social and Market Research
  - 2.9.1. The Sampling Process in Market Research
  - 2.9.2. Sampling Methods
  - 2.9.3. Sample Size Determination
  - 2.9.4. Sample Error
- 2.10. Marketing Information Systems
  - 2.10.1. Concept
  - 2.10.2. Opportunity and Threat Analysis
  - 2.10.3. Objectives
  - 2.10.4. Marketing Strategies
  - 2.10.5. Actions, Results and Control

### Module 3. Databases: Design and Management

- 3.1. Introduction to Databases
  - 3.1.1. What is a Database?
  - 3.1.2. History of Database Systems
- 3.2. Information System and Databases
  - 3.2.1. Concepts
  - 3.2.2. Features
  - 3.2.3. Evolution of Databases
- 3.3. Definition and Characteristics of a Database Management System
  - 3.3.1. Definition
  - 3.3.2. Features
- 3.4. Architecture of Database Management Systems
  - 3.4.1. Centralized and Client-Server Architectures
  - 3.4.2. Server Systems Architectures
  - 3.4.3. Parallel Systems
  - 3.4.4. Distributed Systems
  - 3.4.5. Types of Networks
- 3.5. Main Database Management Systems
  - 3.5.1. Types of DBMS
- 3.6. Development of Database Applications
  - 3.6.1. Web Interfaces for Databases
  - 3.6.2. Performance Tuning
  - 3.6.3. Performance Testing
  - 3.6.4. Standardization
  - 3.6.5. E-Commerce
  - 3.6.6. Inherited Systems
- 3.7. Database Design Stages
  - 3.7.1. Conceptual Design
  - 3.7.2. Logical Design
  - 3.7.3. Application Design

- 3.8. Database Implementation
  - 3.8.1. Structured Query Language (SQL)
  - 3.8.2. Data Processing
  - 3.8.3. Data Query
  - 3.8.4. SQL Database Management
  - 3.8.5. Working with SQLite Databases
- 3.9. Notions of HTML and Regular Expressions
  - 3.9.1. Structure and Code of a Web Page
  - 3.9.2. HTML and CSS Tags and Attributes
  - 3.9.3. Text Searching with Regular Expressions
  - 3.9.4. Special Characters, Sets, Groups and Repetitions
- 3.10. Collecting and Storing Data from Web Pages
  - 3.10.1. Introduction to Web Scraping Tools
  - 3.10.2. Programming Web Scraping Tools in Python
  - 3.10.3. Searching and Obtaining Information with Regular Expressions
  - 3.10.4. Searching and Obtaining Information with BeautifulSoup
  - 3.10.5. Storing in Databases
  - 3.10.6. Exporting Results in Comma-Separated Value Files

#### Module 4. Data Analysis and Debugging

- 4.1. Data files: Coding and Transformation
  - 4.1.1. Data Coding
  - 4.1.2. Data Transformation
- 4.2. Data Integrity Control: Univariate Study
  - 4.2.1. Models
  - 4.2.2. Properties
- 4.3. Data Integrity Control: Bivariate Study
  - 4.3.1. Models
  - 4.3.2. Properties
- 4.4. Data Integrity Control: Multivariate Study
  - 4.4.1. Models
  - 4.4.2. Properties
- 4.5. Missing Value Detection
  - 4.5.1. Missing Data Problems



- 4.6. Treatment of Missing Values
  - 4.6.1. Missing Value Analysis
- 4.7. Imputation of Missing Values
  - 4.7.1. Imputation of Missing Values in One-Dimensional Variables
  - 4.7.2. Multiple Imputation Methods
- 4.8. Normality Tests for the Assessment of Starting Assumptions for Data Analysis
  - 4.8.1. Types of Tests
  - 4.8.2. Examples
- 4.9. Homoscedasticity Tests for the Assessment of Starting Assumptions for Data Analysis
  - 4.9.1. Types of Tests
  - 4.9.2. Examples
- 4.10. Independence Tests for the Assessment of Starting Assumptions for Data Analysis
  - 4.10.1. Types of Tests
  - 4.10.2. Examples

## Module 5. Statistical System and Economic Indicators

- 5.1. Introduction
  - 5.1.1. Economics Field
  - 5.1.2. Three Principles of Economics: Optimality, Equilibrium and Empiricism
  - 5.1.3. Economic Methods and Issues
- 5.2. Demand, Supply and Equilibrium
  - 5.2.1. The Markets
  - 5.2.2. How do Buyers Behave?
  - 5.2.3. How do Sellers Behave?
  - 5.2.4. Supply and Demand in Equilibrium
- 5.3. Consumers, Sellers and Incentives
  - 5.3.1. The Buyer's Problem
  - 5.3.2. From the Buyer's Problem to the Demand Curve
  - 5.3.3. Demand Elasticities and Cost of Living Indexes
  - 5.3.4. Consumer Surplus
  - 5.3.5. The Seller's Problem
  - 5.3.6. From the Seller's Problem (In a Competitive Market) to the Supply Curve
  - 5.3.7. The Producer's Surplus

- 5.4. Perfect Competition and the Invisible Hand
  - 5.4.1. Perfect Competition and Efficiency
  - 5.4.2. Prices Drive the Invisible Hand
  - 5.4.3. Equity and Efficiency
- 5.5. Macroeconomics and its Evolution
  - 5.5.1. Real and Nominal GDP. Price Indexes
  - 5.5.2. Macroeconomic Issues
  - 5.5.3. What GDP Does Not Measure
  - 5.5.4. National Accounts: GDP, its Measurement and its Limits
- 5.6. Analysis of Differences in the Standard of Living between Countries
  - 5.6.1. Income as a Measurement Element
  - 5.6.2. The Aggregate Production Function and Productivity
  - 5.6.3. Technology
- 5.7. Economic Growth
  - 5.7.1. The Importance of Economic Growth
  - 5.7.2. Sources of Economic Growth
  - 5.7.3. Introduction to Growth Accounting
  - 5.7.4. Growth, Inequality and Poverty
- 5.8. Short-Term Economic Analysis
  - 5.8.1. Business Cycles
  - 5.8.2. Macroeconomic Equilibrium and Cycles
  - 5.8.3. Multipliers and Short- and Medium-Term Equilibrium
- 5.9. Stabilizing Policies
  - 5.9.1. Monetary Policy
  - 5.9.2. Fiscal Policy
- 5.10. Macroeconomics and International Trade
  - 5.10.1. The Advantages of International Trade
  - 5.10.2. Accounting for International Trade
  - 5.10.3. International Trade and Economic Growth

## Module 6. Statistical Software

- 6.1. Introduction to the R Environment
  - 6.1.1. How R Works?
  - 6.1.2. Creating, Listing and Removing Objects in Memory
- 6.2. Console in R
  - 6.2.1. Console Environment in R
  - 6.2.2. Main Controls
- 6.3. Script Mode in R
  - 6.3.1. Console Environment in R
  - 6.3.2. Main Commands
- 6.4. Objects in R
  - 6.4.1. Objects
  - 6.4.2. Reading Data From a File
  - 6.4.3. Saving Data
  - 6.4.4. Generating Data
- 6.5. Execution Flow Control Structures
  - 6.5.1. Conditional Structures
  - 6.5.2. Repetitive/Iterative Structures
  - 6.5.3. Vectors and Arrays
- 6.6. Operations with Objects
  - 6.6.1. Creation of Objects
  - 6.6.2. Converting Objects
  - 6.6.3. Operators
  - 6.6.4. How to Access the Values of an Object: the Indexing System?
  - 6.6.5. Accessing an Object's Values with Names
  - 6.6.6. The Data Editor
  - 6.6.7. Simple Arithmetic Functions
  - 6.6.8. Calculations With Arrays
- 6.7. Functions in R
  - 6.7.1. Loops and Vectorization
  - 6.7.2. Writing a Program in R
  - 6.7.3. Creating Your Own Functions

- 6.8. Graphics in R
  - 6.8.1. Handling Graphics
    - 6.8.1.1. Opening Multiple Graphics Devices
    - 6.8.1.2. Laying out a Chart
  - 6.8.2. Graphical Functions
  - 6.8.3. Low-Level Graphing Commands
  - 6.8.4. Graphical Parameters
  - 6.8.5. The Grid and Lattice Packages
- 6.9. R Packages
  - 6.9.1. R Library
  - 6.9.2. R Packages
- 6.10. Statistics in R
  - 6.10.1. A Simple Example of Analysis of Variance
  - 6.10.2. Formulas
  - 6.10.3. Generic Functions

## Module 7. Commercial Research and Market Analysis: Procedures and Applications

- 7.1. Fundamentals of Marketing Research
  - 7.1.1. Concept of Marketing Research and Marketing
  - 7.1.2. Utility of Market Research
  - 7.1.3. Market Research Ethics
- 7.2. Market Research Applications
  - 7.2.1. The Value of Research for Managers
  - 7.2.2. Factors in the Decision to Investigate the Market
  - 7.2.3. Main Objectives of Market Research
- 7.3. Types of Market Research
  - 7.3.1. Exploratory Research
  - 7.3.2. Descriptive Research
  - 7.3.3. Causal Investigations

- 7.4. Types of Information
  - 7.4.1. Elaboration: Primary and Secondary
  - 7.4.2. Qualitative Nature
  - 7.4.3. Quantitative Nature
- 7.5. Organisation of Market Research
  - 7.5.1. Internal Market Research Department
  - 7.5.2. Research Outsourcing
  - 7.5.3. Decision Factors: Internal Vs. External
- 7.6. Research Project Management
  - 7.6.1. Market Research as a Process
  - 7.6.2. Planning Stages in Market Research
  - 7.6.3. Execution Stages in Marketing Research
  - 7.6.4. Managing a Research Project
- 7.7. Desk Studies
  - 7.7.1. Objectives of Desk Studies
  - 7.7.2. Sources of Secondary Information
  - 7.7.3. Results of the Desk Studies
- 7.8. Field Work
  - 7.8.1. Obtaining Primary Information
  - 7.8.2. Organization of Information Gathering
  - 7.8.3. Interviewer Control
- 7.9. Online Market Research
  - 7.9.1. Quantitative Research Tools for Online Markets
  - 7.9.2. Dynamic Qualitative Customer Research Tools
- 7.10. The Market Research Proposal
  - 7.10.1. Objectives and Methodology
  - 7.10.2. Completion Deadlines
  - 7.10.3. Budget



## Module 8. Multivariate Statistical Techniques

- 8.1. Introduction
- 8.2. Nominal Scale
  - 8.2.1. Measures of Association for 2x2 Tables
    - 8.2.1.1. Phi Coefficient
    - 8.2.1.2. Relative Risk
    - 8.2.1.3. Cross-Product Ratio (Odds Ratio)
  - 8.2.2. Measures of Association for IxJ Tables
    - 8.2.2.1. Contingency Ratio
    - 8.2.2.2. Cramer's V
    - 8.2.2.3. Lambdas
    - 8.2.2.4. Tau of Goodman and Kruskal
    - 8.2.2.5. Uncertainty Coefficient
  - 8.2.3. Kappa Coefficient
- 8.3. Ordinal Scale
  - 8.3.1. Gamma Coefficients
  - 8.3.2. Kendall's Tau-B and Tau-C
  - 8.3.3. Sommers' D
- 8.4. Interval or Ratio Scale
  - 8.4.1. Eta Coefficient
  - 8.4.2. Pearson's and Spearman's Correlation Coefficients
- 8.5. Stratified Analysis in 2x2 Tables
  - 8.5.1. Stratified Analysis
  - 8.5.2. Stratified Analysis in 2x2 Tables
- 8.6. Problem Formulation in Log-linear Models
  - 8.6.1. The Saturated Model for Two Variables
  - 8.6.2. The General Saturated Model
  - 8.6.3. Other Types of Models
- 8.7. The Saturated Model
  - 8.7.1. Calculation of Effects
  - 8.7.2. Goodness of Fit
  - 8.7.3. Test of K effects
  - 8.7.4. Partial Association Test





- 8.8. The Hierarchical Model
  - 8.8.1. The Backward Method
- 8.9. Probit Response Models
  - 8.9.1. Problem Formulation
  - 8.9.2. Parameter Estimation
  - 8.9.3. Chi-Square Goodness-of-Fit Test
  - 8.9.4. Parallelism Test for Groups
  - 8.9.5. Estimation of the Dose Required to Obtain a Given Response Ratio
- 8.10. Binary Logistic Regression
  - 8.10.1. Problem Formulation
  - 8.10.2. Qualitative Variables in Logistic Regression
  - 8.10.3. Selection of Variables
  - 8.10.4. Parameter Estimation
  - 8.10.5. Goodness of Fit
  - 8.10.6. Classification of Individuals
  - 8.10.7. Prediction

## Module 9. Econometric Methods in Economics and Finance

- 9.1. Introduction to the Use of R
  - 9.1.1. Main Commands
  - 9.1.2. Necessary Packages
- 9.2. Introduction to Econometrics
  - 9.2.1. Nature and Content of Econometrics
  - 9.2.2. Economic Modeling
- 9.3. Linear Regression
  - 9.3.1. The General Linear Model (GLM)
  - 9.3.2. Model Hypotheses
  - 9.3.3. Ordinary Least Squares (OLS) Estimation
  - 9.3.4. Inference and Prediction in the GLM
  - 9.3.5. Structural Change Contrasts
  - 9.3.6. Multicollinearity and Measurement Errors

- 9.4. Models with Cross-Section Data
  - 9.4.1. Causes of Heteroscedasticity
  - 9.4.2. Heteroscedasticity Contrasts
  - 9.4.3. The Generalized Least Squares Estimator
  - 9.4.4. The Feasible Weighted Least Squares Estimator
- 9.5. Models with Time Series Data
  - 9.5.1. Magic "Potagia" or the Spurious Regressions
  - 9.5.2. Stationarity and Unit Roots
  - 9.5.3. Non-Stationarity and Cointegration
  - 9.5.4. Cointegration and Error Correction Mechanisms (ECMs)
  - 9.5.5. Regression Models with Stationary Time Series: Autocorrelation
  - 9.5.6. The Generalized Least Squares Estimator (GLS)
  - 9.5.7. Leading Indicators: Granger Causality and Contemporaneous Correlation
- 9.6. Stationary Dynamic Models
  - 9.6.1. Stationary Dynamic Models
    - 9.6.1.1. ARIMA
    - 9.6.1.2. ARIMAX
  - 9.6.2. Estimation of ARIMA Models
  - 9.6.3. Diagnosis of ARIMA Models
- 9.7. Endogeneity, Instrumental Variables and MC2E
  - 9.7.1. What is the Endogeneity Problem, What Problems Does It Cause?
  - 9.7.2. Origins of Endogeneity
    - 9.7.2.1. Omission of Some Relevant Variable (Because It Is Not Observable) That Is Correlated with Some Other Explanatory Variable
    - 9.7.2.2. Errors in the Measurement
    - 9.7.2.3. Regression Model with Lags and Autocorrelation in Errors
  - 9.7.3. Instrumental Variables Estimator and Two-Stage Least Squares (MC2E)
  - 9.7.4. Endogeneity Contrasts and Overestimation Constraints
- 9.8. Regression Models with Panel Data
  - 9.8.1. Specification of Panel Data Models
  - 9.8.2. Estimation of Models with Fixed Effects
  - 9.8.3. Estimation of Models with Random Effects
  - 9.8.4. System of Apparently Unrelated Equations

- 9.9. Spatial Econometric Models
  - 9.9.1. Introduction to Statistics and Measures of Spatial Association
  - 9.9.2. The Construction of the Distance Matrix for Measuring Spatial Dependencies
  - 9.9.3. Model specifications with spatial dependence
    - 9.9.3.1. Error Model with Spatial Delays
    - 9.9.3.2. The Model with Spatially Autoregressive Errors
  - 9.9.4. Ordinary Least Squares Problems for Estimating Spatially Delayed Models and the Two-Stage Least Squares Estimator
- 9.10. Quantile Regression Models
  - 9.10.1. Regression on Means and Quantile Regression
  - 9.10.2. Interquantile Regression Estimation
  - 9.10.3. Graphical Representation of the Solution

## Module 10. Survey Segmentation and Processing Techniques

- 10.1. Sample Survey
  - 10.1.1. Objective of a Sample Survey. Most Common Data Collection Methods. Sources of Error in Surveys
  - 10.1.2. Sample Selection: Sampling and Size. Secondary Sources
  - 10.1.3. Official Surveys: National Institute of Statistics
  - 10.1.4. Some Official Surveys: National Health Survey, European Health Survey
- 10.2. Validity and Reliability of Questionnaires
  - 10.2.1. Factorial Validity
  - 10.2.2. Internal Consistency: Cronbach's Alpha
- 10.3. Statistical Analysis of Data from Two-Dimensional Contingency Tables
  - 10.3.1. Possible Analyses on a Two-Dimensional Contingency Table
  - 10.3.2. The Logic of Log-Linear Analysis: Decomposition of a Two-Dimensional Contingency Table Basic Elements of the Logarithmic-linear analysis. Effects and Parameters
  - 10.3.3. Calculation and Interpretation of Parameters
  - 10.3.4. Logarithmic-Linear Models for a 2-Way Table
  - 10.3.5. Hierarchical Models. Relationship Between Independence Hypotheses and Hierarchical Log-linear Models. Contrasts for the Significance of Parameters
  - 10.3.6. Contrasts for Significance of Effects. Contrasts for the Goodness-of-Fit of a Model

- 10.4. Study of a Contingency Table by Means of Correspondence Analysis
  - 10.4.1. Profiles and Chi-Square Distance
  - 10.4.2. Inertia Absorption
  - 10.4.3. Representation Quality
  - 10.4.4. Element Contribution to the Factor
  - 10.4.5. Contribution of the Factor to the Element. Principle of Distributional Equivalence
- 10.5. Segmentation Analysis: CHAID Algorithm
  - 10.5.1. Automatic Interaction Detection Methods
  - 10.5.2. CHAID Algorithm: Stages of the Process, Types of Predictors, Methods of Stopping the Algorithm
  - 10.5.3. Behavior of CHAID in the Presence of Simpson's Paradox
- 10.6. Statistical Analysis of Data from Three-Dimensional Contingency Tables
  - 10.6.1. Concepts of Association and Interaction. Simpson's Paradox
  - 10.6.2. Components that Influence the Magnitude of Frequencies in a Three-Dimensional Contingency Table
    - 10.6.2.1. Complete Independence
    - 10.6.2.2. Multiple Independence and Conditional Independence
    - 10.6.2.3. Saturated Model for a Three-Way Table
  - 10.6.3. Log-Linear Hierarchical Linear Models for a Three-Way Table
    - 10.6.3.1. Degrees of Freedom of the Models
    - 10.6.3.2. Relationship Between Independence Hypotheses and Hierarchical Log-linear Models
  - 10.6.4. Evaluation of the Models. Significance Test for the Goodness-of-Fit of a Model. Significance Test of the Effects
- 10.7. Discrete Choice and Multidimensional Preference Models
  - 10.7.1. Discrete Choice Models
  - 10.7.2. Multidimensional Preference
- 10.8. Classification and Regression Trees and Random Forests
  - 10.8.1. Classification and Regression Trees
  - 10.8.2. Random Forests
- 10.9. Multidimensional scaling
  - 10.9.1. Introduction
  - 10.9.2. Distance and Similarity
  - 10.9.3. Classical Solution
  - 10.9.4. Similarities
- 10.10. Shopping Cart Analysis
  - 10.10.1. Shopping Cart Analysis
  - 10.10.2. Example of Applications



*Don't think twice and opt for a program that will bring you closer to the main hypotheses based on economic theories and the elaboration of 100% reliable behavioral predictions"*



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 Professional Master's Degree in Statistics Applied to Economics guarantees students, in addition to the most rigorous and up-to-date education, access to a Professional Master's Degree diploma issued by TECH Technological University.



“

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



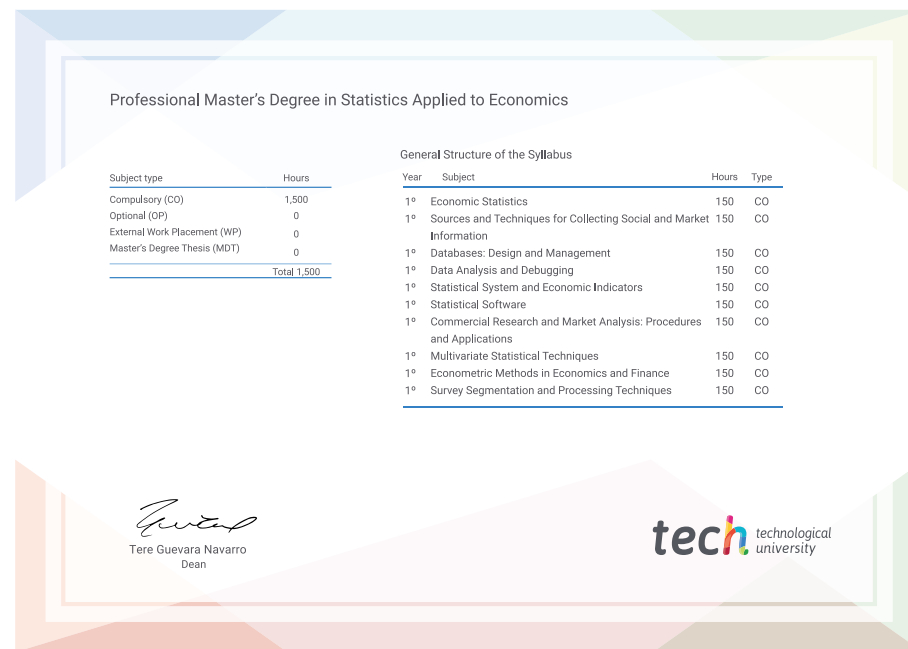
This **Professional Master's Degree in Statistics Applied to Economics** contains the most complete and up-to-date program on the market.

After the student has passed the assessments, they will receive their corresponding **Professional Master's Degree** diploma issued by **TECH Technological University** via tracked delivery\*.

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

Title: **Professional Master's Degree in Statistics Applied to Economics**

Official N° of Hours: **1,500 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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education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commi  
personalized service innovation  
knowledge present quality  
online learning  
development la  
virtual classroom



**Professional Master's  
Degree**  
Statistics Applied to Economics

- » Modality: online
- » Duration: 12 months
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

# Professional Master's Degree

## Statistics Applied to Economics

