

# Executive Master's Degree Business Economics and Statistics

**M B E S**



## Executive Master's Degree Business Economics and Statistics

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

Target Group: University graduates and professionals  
in the field of Business Sciences who would like to  
further their studies in this area.

Website: [www.techtute.com/in/school-of-business/professional-master-degree/master-business-economics-statistics](http://www.techtute.com/in/school-of-business/professional-master-degree/master-business-economics-statistics)

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# 01 Welcome

In a world where resources are limited, but opportunities are infinite, having in-depth knowledge of economics as a means of distributing goods within companies is essential, as it allows for optimal management of the organization while responding to the needs of consumers. That is exactly what this TECH Executive Master's Degree will address in the form of an exhaustive analysis of the importance and functioning of economics and statistics in the company, including how these disciplines play a fundamental role in the development and consolidation of the organization. This knowledge will be the professional's main asset when it comes to entering a business field that is increasingly demanding experts who can conduct an exhaustive analysis of the economy, both internally and externally.



Executive Master's Degree in Business Economics and Statistics.  
TECH Technological University



“

*TECH puts in your hand the most complete compendium of contents in the field with a single purpose: Train you to work in companies in all sectors while having full knowledge of the functioning of its economy”*

02

# Why Study at TECH?

TECH is the world's largest 100% online business school. It is an elite business school, with a model based on the highest academic standards. A world-class centre for intensive managerial skills training.



“

*TECH is a university at the forefront of technology, and puts all its resources at the student's disposal to help them achieve entrepreneurial success"*

## At TECH Technological University



### Innovation

The university offers an online learning model that combines the latest educational technology with the most rigorous teaching methods. A unique method with the highest international recognition that will provide students with the keys to develop in a rapidly-evolving world, where innovation must be every entrepreneur's focus.

"Microsoft Europe Success Story", for integrating the innovative, interactive multi-video system.



### The Highest Standards

Admissions criteria at TECH are not economic. Students don't need to make a large investment to study at this university. However, in order to obtain a qualification from TECH, the student's intelligence and ability will be tested to their limits. The institution's academic standards are exceptionally high...

**95%** | of TECH students successfully complete their studies



### Networking

Professionals from countries all over the world attend TECH, allowing students to establish a large network of contacts that may prove useful to them in the future.

**100,000+**  
executives trained each year

**200+**  
different nationalities



### Empowerment

Students will grow hand in hand with the best companies and highly regarded and influential professionals. TECH has developed strategic partnerships and a valuable network of contacts with major economic players in 7 continents.

**500+** | collaborative agreements with leading companies



### Talent

This program is a unique initiative to allow students to showcase their talent in the business world. An opportunity that will allow them to voice their concerns and share their business vision.

After completing this program, TECH helps students show the world their talent.



### Multicultural Context

While studying at TECH, students will enjoy a unique experience. Study in a multicultural context. In a program with a global vision, through which students can learn about the operating methods in different parts of the world, and gather the latest information that best adapts to their business idea.

TECH students represent more than 200 different nationalities.





TECH strives for excellence and, to this end, boasts a series of characteristics that make this university unique:



### Analysis

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TECH explores the student's critical side, their ability to question things, their problem-solving skills, as well as their interpersonal skills.



### Academic Excellence

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TECH offers students the best online learning methodology. The university combines the Relearning method (a postgraduate learning methodology with the highest international rating) with the Case Study. A complex balance between tradition and state-of-the-art, within the context of the most demanding academic itinerary.



### Economy of Scale

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TECH is the world's largest online university. It currently boasts a portfolio of more than 10,000 university postgraduate programs. And in today's new economy, **volume + technology = a groundbreaking price**. This way, TECH ensures that studying is not as expensive for students as it would be at another university.



### Learn with the best

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In the classroom, TECH's teaching staff discuss how they have achieved success in their companies, working in a real, lively, and dynamic context. Teachers who are fully committed to offering a quality specialization that will allow students to advance in their career and stand out in the business world.

Teachers representing 20 different nationalities.



*At TECH, you will have access to the most rigorous and up-to-date case studies in the academic community"*

03

# Why Our Program?

Studying this TECH program means increasing the chances of achieving professional success in senior business management.

It is a challenge that demands effort and dedication, but it opens the door to a promising future. Students will learn from the best teaching staff and with the most flexible and innovative educational methodology.



“

*We have highly qualified teachers and the most complete syllabus on the market, which allows us to offer you training of the highest academic level"*

This program will provide students with a multitude of professional and personal advantages, particularly the following:

**01**

### A significant career boost

By studying at TECH, students will be able to take control of their future and develop their full potential. By completing this program, students will acquire the skills required to make a positive change in their career in a short period of time.

*70% of participants achieve positive career development in less than 2 years.*

**02**

### Develop a strategic and global vision of companies

TECH offers an in-depth overview of general management to understand how each decision affects each of the company's different functional areas.

*Our global vision of companies will improve your strategic vision.*

**03**

### Consolidate the student's senior management skills

Studying at TECH means opening the doors to a wide range of professional opportunities for students to position themselves as senior executives, with a broad vision of the international environment.

*You will work on more than 100 real senior management cases.*

**04**

### Take on new responsibilities

The program will cover the latest trends, advances and strategies, so that students can carry out their professional work in a changing environment.

*45% of graduates are promoted internally.*

05

### Access to a powerful network of contacts

TECH connects its students to maximize opportunities. Students with the same concerns and desire to grow. Therefore, partnerships, customers or suppliers can be shared.

*You will find a network of contacts that will be instrumental for professional development.*

06

### Thoroughly develop business projects

Students will acquire a deep strategic vision that will help them develop their own project, taking into account the different areas in companies.

*20% of our students develop their own business idea.*

07

### Improve soft skills and management skills

TECH helps students apply and develop the knowledge they have acquired, while improving their interpersonal skills in order to become leaders who make a difference.

*Improve your communication and leadership skills and enhance your career.*

08

### Be part of an exclusive community

Students will be part of a community of elite executives, large companies, renowned institutions, and qualified professors from the most prestigious universities in the world: the TECH Technological University community.

*We give you the opportunity to train with a team of world renowned teachers.*

# 04 Objectives

The objectives set by the program are based on addressing the additional preparation needs of Business Science professionals in the areas of business economics and statistics. In this sense, a complete and optimal training program has been realistically established to lead students to academic excellence and encourage them to achieve an efficient progression in their professional careers. Thus, the program will be a journey for students toward both personal and professional growth that will lead them to the highest level of performance as experts in business.





“

*Your goals are our goals, and that is why we put all our tools at your disposal to help you achieve them”*

Your goals are our goals.

We work together to help you achieve them.

The Executive Master's Degree in Business Economics and Statistics trains students to:

01

Know how to correctly administrate and manage companies of all sizes and in all sectors

04

Have a thorough understanding of the fundamentals of microeconomics and macroeconomics

02

Have a global vision of economics at a global scale



03

Know how to apply and work with business mathematics

05

Know how to work with descriptive statistics and probability



06

Understand what Information and Communication Technology is and its use in today's businesses

08

Know the fundamentals of business administration through the description of its elements, environment, operations and organization

09

Possess all elements required for assertive decision making

07

Know how to analyze the application of econometrics at a global scale

10

Understand the area of management and administration



11

Understand the fundamentals of supply, demand and market preferences

12

Know the basic elements that make up business mathematics: linear and matrix algebra, matrices, matrix transposition, calculus, matrix inversion, systems of equations, etc.

13

Understand the different techniques and mathematical methods used within the financial framework of a company

14

Recognize the basic concepts of statistics and probability

15

Apply the different methods of data selection, grouping and presentation

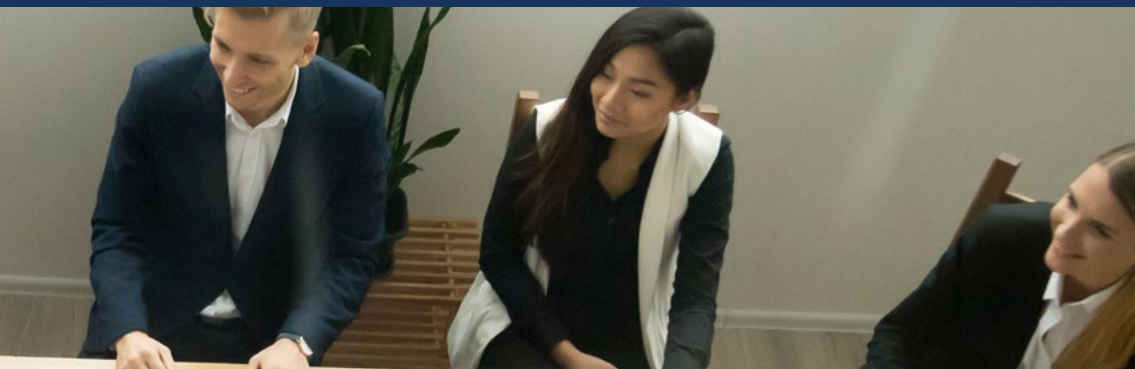


16

Design and select samples by identifying the means, techniques and tools to record information

18

Understand the structure of the Spanish financial system



19

Understand the interaction of the Spanish financial system in relation to the international financial system

17

Interpret the characteristics, functions and types of the various information technology systems

20

Understand the changes in domestic and foreign demand

# 05 Skills

After passing the assessments for the Executive Master's Degree in Business Economics and Statistics, professionals will have acquired the skills required for quality and up-to-date praxis based on the most innovative teaching methodology.





“

*This program will help you acquire the skills  
you need to excel in your daily work”*

01

Understand the fundamentals of economics

02

Adopt a critical view of national and international economic problems

03

Identify the basic variables of microeconomics, such as: public intervention, externalities and public goods, static and dynamic game theory, etc.

04

Integrate the effects of microeconomic variables within the business environment



05

Analyze economic theories by means of estimation methods, calculations or by interval and hypothesis testing, both parametric and non-parametric

06

Conduct economic policy assessments of a country's government

07

Generate predictions about a country's economy

08

Analyze economic information



09

Intervene in technological scenarios for training processes adaptable to the new context

10

Explain the objectives of macroeconomics and the instruments of economic policy

11

Explain the use and impact of these instruments on goods and financial markets







12

Apply the various probability distribution and statistical models for reliable decision making in relation to the company's situation

13

Manage investment results in accordance with company policies and the country's economy

14

Apply mathematical techniques and methods to the financial framework of the company

06

# Structure and Content

The syllabus for this Executive Master's Degree has been designed and created by a team of experts in the field to respond specifically to the needs of Business Science professionals. This compendium of contents has also been created with a focus on applied learning, which will allow professionals to successfully intervene by means of a broad vision connected to real environments in the profession. Thus, this syllabus will become students' main asset when it comes to successfully inserting themselves into a labor market that increasingly demands more professionals specialized in business economics and statistics.



“

*The most complete syllabus on the market  
with a single purpose: To specialize the best  
managers in business”*

## Syllabus

Economics, understood as the science that studies the distribution of scarce resources among the members of a society to satisfy their needs, is a crucial aspect when it comes to achieving good business development. But, in a world where resources are limited, and the needs of the population are changing and infinite, it is crucial to be able to properly distribute goods as a means to respond to user requirements. This is where economics helps and plays a crucial role in the development and consolidation of companies around the world.

Being fully aware of this, TECH professionals have designed this very complete Executive Master's Degree in Business Economics and Statistics, which was created with the aim of training business professionals to conduct in-depth analyses in business economics and, by means of statistical tools, to obtain data that can help understand where the organization is headed and the changes or steps to follow to achieve optimal growth.

Thus, throughout the program, students will analyze a multitude of case studies that will give them an in-depth understanding of business economics and statistics. This complete immersion in real situations will give you a more complete and effective vision of the current landscape in global business, and will help you understand the behavior of customers in face-to-face and digital environments, where understanding their consumption patterns will become managers' main ally when it comes to establishing successful strategies.

This program has been created so students can acquire the essential knowledge in the field in an intensive and efficient manner. An opportunity to improve your training, with the convenience of the most effective online method in the teaching market. That way, TECH is sure to offer students the opportunity to take a program whose academic curriculum incorporates all the knowledge mentioned above.

This program takes place over 12 months and is taught entirely online.

<b>Module 1</b>	Business Administration: Introduction and Organization
<b>Module 2</b>	Introduction to Economics
<b>Module 3</b>	Business Mathematics
<b>Module 4</b>	Microeconomics
<b>Module 5</b>	Statistics I
<b>Module 6</b>	Introduction to ICT
<b>Module 7</b>	The Spanish Economy and World Economy
<b>Module 8</b>	Macroeconomics
<b>Module 9</b>	Statistics II
<b>Module 10</b>	Econometrics



### Where, When and How is it Taught?

TECH offers the possibility of developing this Executive Master's Degree in Business Economics and Statistics completely online. Over the course of 12 months, you will be able to access all the contents of this program at any time, allowing you to self-manage your study time.

*A unique, key, and decisive educational experience to boost your professional development and make the definitive leap.*

**Module 1. Business Administration: Introduction and Organization**

**1.1. The Company and its Components**

- 1.1.1. The Concept of Business
- 1.1.2. Functions and Classifications of Business Objectives
- 1.1.3. Entrepreneurship
- 1.1.4. Types of Companies

**1.2. The Company as a System**

- 1.2.1. Concepts of the System
- 1.2.2. The Models
- 1.2.3. Company Subsystems
- 1.2.4. Subsystem of Values

**1.3. The Company Setting**

- 1.3.1. Setting and Value
- 1.3.2. General Environment
- 1.3.3. Specific Environment
- 1.3.4. Analysis Tools

**1.4. Management Function**

- 1.4.1. Basic Concepts
- 1.4.2. What Does it Mean to Manage a Company?
- 1.4.3. Decision-Making
- 1.4.4. Leadership

**1.5. Business Planning**

- 1.5.1. Business Plan
- 1.5.2. Elements of Planning
- 1.5.3. Stages
- 1.5.4. Planning Tools

**1.6. Business Control**

- 1.6.1. Concept, Types and Terminology
- 1.6.2. Management Control
- 1.6.3. Quality Control
- 1.6.4. Balanced Scorecard

**1.7. Business Organization**

- 1.7.1. Basic Concepts
- 1.7.2. Organizational structure
- 1.7.3. Cultural Dimensions
- 1.7.4. Model Structures

**1.8. Human Resource Management**

- 1.8.1. Motivation
- 1.8.2. Recruitment and Selection
- 1.8.3. Personnel Training
- 1.8.4. Performance Assessment

**1.9. Elements in Marketing and Finance**

- 1.9.1. Concept and Stages
- 1.9.2. Marketing and the Markets
- 1.9.3. Strategic Marketing
- 1.9.4. Relations and Synergies

**Module 2. Introduction to Economics**

**2.1. Introduction to Market Supply, Demand, Equilibrium and Changes**

- 2.1.1. Economics: Principles and Definitions
  - 2.1.1.1. Economic Principles and Concepts
  - 2.1.1.2. Micro and Macro Economics
  - 2.1.1.3. Resource Scarcity
  - 2.1.1.4. Basic Economic Models
- 2.1.2. Opportunity Cost
  - 2.1.2.1. Analysis
  - 2.1.2.2. Net Present Value
- 2.1.3. The Break-Even Point
  - 2.1.3.1. Concept
  - 2.1.3.2. Type of Costs
  - 2.1.3.3. Calculation and Results

**2.2. Market Demand, Supply and Preferences**

- 2.2.1. Markets and Market Types
  - 2.2.1.1. The Concept of Market
  - 2.2.1.2. Types of Markets
  - 2.2.1.3. The Nature of Products
- 2.2.2. Market Demand
  - 2.2.2.1. Definition and Conceptualization
  - 2.2.2.2. Determinants of Demand
- 2.2.3. Market Supply
  - 2.2.3.1. Definition and Conceptualization
  - 2.2.3.2. Determination of Supply
  - 2.2.3.3. The Influence of Competition
- 2.2.4. Equilibrium and Statics
  - 2.2.4.1. Comparative Statics
  - 2.2.4.2. Uses of Comparative Statics
  - 2.2.4.3. Economic Equilibrium
  - 2.2.4.4. Dynamic Equilibrium

**2.3. Budget Constraints and Consumer Equilibrium**

- 2.3.1. Budget Constraints and Shifts
  - 2.3.1.1. Concept
  - 2.3.1.2. Slope of the Equilibrium Line
  - 2.3.1.3. Movements on the Equilibrium Line
- 2.3.2. Optimal Choice
  - 2.3.2.1. Concept
  - 2.3.2.2. Indifference Curve
  - 2.3.2.3. Utility Function
- 2.3.3. Optimal Choice
  - 2.3.3.1. Concept
  - 2.3.3.2. Indifference Curve
  - 2.3.3.3. Utility Function

**2.4. Consumer and Producer Surplus. Competitive Equilibrium Efficiency**

- 2.4.1. Consumer and Producer Surplus
  - 2.4.1.1. Law of Diminishing Returns
  - 2.4.1.2. Supply and Demand Curve
  - 2.4.1.3. Increasing and Decreasing Marginal Utility
- 2.4.2. Competitive Equilibrium Efficiency
  - 2.4.2.1. Concept
  - 2.4.2.2. The Mathematical Conditions of Short-Run Equilibrium
  - 2.4.2.3. The Mathematical Conditions of Long-Run Competitive Equilibrium

<p><b>2.5. Maximum and Minimum Prices: The Effect of Indirect Taxation</b></p> <p>2.5.1. Maximum and Minimum Prices                      2.5.1.1. Conceptualization                      2.5.1.2. Maximum Price                      2.5.1.3. Minimum Price</p> <p>2.5.2. Effects of Indirect Taxes                      2.5.2.1. Definition and Major Concepts                      2.5.2.2. Legal and Economic Impact                      2.5.2.3. Economic Impact Analysis</p>	<p><b>2.6. Price Elasticity of Demand and Determinants of Elasticity</b></p> <p>2.6.1. Price Elasticity of Demand                      2.6.1.1. Concepts                      2.6.1.2. Factors that Determine Price Elasticity of Demand                      2.6.1.3. Total Income and Elasticity</p> <p>2.6.2. Summary of the Types of Elasticity                      2.6.2.1. Perfectly or Infinitely Elastic                      2.6.2.2. Perfectly or Infinitely Inelastic                      2.6.2.3. Greater and Less Than 1                      2.6.2.4. Equal to 0</p>	<p><b>2.7. Cross Elasticity of Demand and Analytical Calculation</b></p> <p>2.7.1. Cross Elasticity                      2.7.1.1. Context                      2.7.1.2. Concepts and Definitions                      2.7.1.3. Substitute Goods and Independent Goods</p> <p>2.7.2. Analytical Calculation                      2.7.2.1. Formula                      2.7.2.2. Calculations and Examples</p>	<p><b>2.8. Production Function and Yields</b></p> <p>2.8.1. Production Function                      2.8.1.1. Basic Assumptions                      2.8.1.2. Total Production                      2.8.1.3. Average Production                      2.8.1.4. Marginal Production</p> <p>2.8.2. Law of Diminishing Returns                      2.8.2.1. Concept                      2.8.2.2. Graph and Interpretations                      2.8.2.3. Returns to Scale</p>
<p><b>2.9. Short-Term and Long-Term Costs</b></p> <p>2.9.1. Loss Functions                      2.9.1.1. Definitions and Concepts                      2.9.1.2. Company Costs                      2.9.1.3. Formulation and Representations</p> <p>2.9.2. Short-Term Costs                      2.9.2.1. Concept and Definitions                      2.9.2.2. Types of Short-Term Costs                      2.9.2.3. Formulation</p> <p>2.9.3. Long-Term Costs                      2.9.3.1. Concept and Definitions                      2.9.3.2. Types of Long-Term Costs                      2.9.3.3. Formulation</p>	<p><b>2.10. Basic Economic Magnitudes</b></p> <p>2.10.1. Economic Activity                      2.10.1.1. Conceptualization                      2.10.1.2. Economic growth                      2.10.1.3. The Public Sector                      2.10.1.4. General Objectives</p> <p>2.10.2. Price Indexes and Market Indicators                      2.10.2.1. Conceptualization                      2.10.2.2. Simple and Complex Indexes                      2.10.2.3. Nominal GDP                      2.10.2.4. Real GDP</p> <p>2.10.3. Circular Flow of Income                      2.10.3.1. Conceptualization                      2.10.3.2. Types of Flow: Real and Monetary                      2.10.3.3. Public Sector Intervention</p>	<p><b>2.11. Monetary Policies</b></p> <p>2.11.1. Money and Circulation                      2.11.1.1. Conceptualization and Objectives                      2.11.1.2. The Demand for Money                      2.11.1.3. Circulation</p> <p>2.11.2. Equilibrium in the Money Market and Monetary Policy                      2.11.2.1. Market Equilibrium                      2.11.2.2. Open Market Transactions                      2.11.2.3. Conventional and Unconventional Monetary Policy</p>	<p><b>2.12. Market Structures and Types</b></p> <p>2.12.1. Market Structures                      2.12.1.1. The Concept of Market                      2.12.1.2. Perfect and Imperfect Competition                      2.12.1.3. Monopolies                      2.12.1.4. Oligopolies and Duopolies                      2.12.1.5. Monopsonies                      2.12.1.6. Oligopsonies</p>
<p><b>2.13. Non-Competitive Markets</b></p> <p>2.13.1. Monopolistic Market Competition                      2.13.1.1. The Concept of Monopoly                      2.13.1.2. The Social Cost of Monopolies                      2.13.1.3. Price Discrimination</p> <p>2.13.2. Oligopoly Market Competition                      2.13.2.1. The Concept of Oligopoly                      2.13.2.2. Different Types of Oligopolies</p>	<p><b>2.14. Aggregate Supply and Demand Models</b></p> <p>2.14.1. Aggregate Demand                      2.14.1.1. Concept                      2.14.1.2. Calculation Bases                      2.14.1.3. Aggregate Demand Curve</p> <p>2.14.2. Keynesian Multipliers                      2.14.2.1. Concept                      2.14.2.2. The Effects Caused by the Multiplier                      2.14.2.3. Calculation Bases</p> <p>2.14.3. Aggregate Supply                      2.14.3.1. Concept                      2.14.3.2. Factors                      2.14.3.3. Variations</p>	<p><b>2.15. International Economic Relations</b></p> <p>2.15.1. International Trade                      2.15.1.1. Basic Concepts                      2.15.1.2. Exchange Rate and Terms of Trade                      2.15.1.3. Trade Policy Instruments</p> <p>2.15.2. Balance of Payments and Theories of Exchange Rate                      2.15.2.1. Balance of Payments                      2.15.2.2. Theories of Exchange Rate</p>	

**Module 3. Business Mathematics**

<p><b>3.1. Basic Elements of Linear and Matrix Algebra</b></p> <p>3.1.1. The Vector Space of <math>\mathbb{R}^n</math>, Functions and Variables</p> <p>3.1.1.1. Graphical Representation of Sets in <math>\mathbb{R}</math></p> <p>3.1.1.2. Basic Concepts of Functions of Several Real Variables. Operations with Functions</p> <p>3.1.1.3. Function Types</p> <p>3.1.1.4. Weierstrass Theorem</p>	<p>3.1.2. Optimization with Inequality Constraints</p> <p>3.1.2.1. Two-Variable Graphical Method</p> <p>3.1.3. Function Types</p> <p>3.1.3.1. Separate Variables</p> <p>3.1.3.2. Polynomial Variables</p> <p>3.1.3.3. Rational Variables</p> <p>3.1.3.4. Quadratic Forms</p>	<p><b>3.2. Matrices: Types, Concepts and Operations</b></p> <p>3.2.1. Basic Definitions</p> <p>3.2.1.1. Matrix of Order <math>m</math> by <math>n</math></p> <p>3.2.1.2. Square Matrices</p> <p>3.2.1.3. Identity Matrix</p> <p>3.2.2. Matrix Operations</p> <p>3.2.2.1. Matrix Addition</p> <p>3.2.2.2. Scalar Multiplication</p> <p>3.2.2.3. Matrix Multiplication</p>	<p><b>3.3. Transpose</b></p> <p>3.3.1. Diagonalizable Matrix</p> <p>3.3.2. Transpose Properties</p> <p>3.3.2.1. Involution</p>
<p><b>3.4. Determinants: Calculation and Definition</b></p> <p>3.4.1. The Concept of Determinants</p> <p>3.4.1.1. Determinant Definition</p> <p>3.4.1.2. Square Matrix of Order 2,3 and Greater Than 3</p> <p>3.4.2. Triangular Matrices</p> <p>3.4.2.1. Determinant of Triangular Matrices</p> <p>3.4.2.2. Determinant of Non-Triangular Square Matrices</p> <p>3.4.3. Properties of Determinants</p> <p>3.4.3.1. Simplifying Calculations</p> <p>3.4.3.2. Calculation in any Case</p>	<p><b>3.5. Invertible Matrices</b></p> <p>3.5.1. Properties of Invertible Matrices</p> <p>3.5.1.1. The Concept of Inversion</p> <p>3.5.1.2. Definitions and Basic Concepts</p> <p>3.5.2. Invertible Matrix Calculation</p> <p>3.5.2.1. Methods and Calculation</p> <p>3.5.2.2. Exceptions and Examples</p> <p>3.5.3. Expression Matrices and Matrix Equations</p> <p>3.5.3.1. Expression Matrices</p> <p>3.5.3.2. Matrix Equations</p>	<p><b>3.6. Solving Systems of Equations</b></p> <p>3.6.1. Linear Equations</p> <p>3.6.1.1. Discussion of the System. Rouché–Capelli Theorem</p> <p>3.6.1.2. Cramer's Rule: Solving the System</p> <p>3.6.1.3. Homogeneous Systems</p> <p>3.6.2. Vector Spaces</p> <p>3.6.2.1. Properties of Vector Spaces</p> <p>3.6.2.2. Linear Combination of Vectors</p> <p>3.6.2.3. Linear Dependence and Independence</p> <p>3.6.2.4. Coordinate Vectors</p> <p>3.6.2.5. The Basis Theorem</p>	<p><b>3.7. Quadratic Forms</b></p> <p>3.7.1. Concept and Definition of Quadratic Forms</p> <p>3.7.2. Quadratic Matrices</p> <p>3.7.2.1. Law of Inertia for Quadratic Forms</p> <p>3.7.2.2. Study of the Sign by Eigenvalues</p> <p>3.7.2.3. Study of the Sign by Minors</p>
<p><b>3.8. Functions of One Variable</b></p> <p>3.8.1. Analysis of the Behavior of a Magnitude</p> <p>3.8.1.1. Local Analysis</p> <p>3.8.1.2. Continuity</p> <p>3.8.1.3. Restricted Continuity</p>	<p><b>3.9. Limits of Functions, Domain and Image in Real Functions</b></p> <p>3.9.1. Functions of Several Variables</p> <p>3.9.1.1. Vector of Several Variables</p> <p>3.9.2. The Domain of a Function</p> <p>3.9.2.1. Concept and Applications</p> <p>3.9.3. Function Limits</p> <p>3.9.3.1. Limits of a Function at a Point</p> <p>3.9.3.2. Lateral Limits of a Function</p> <p>3.9.3.3. Limits of Rational Functions</p>	<p>3.9.4. Indeterminacy</p> <p>3.9.4.1. Indeterminacy in Functions with Roots</p> <p>3.9.4.2. Indetermination <math>0/0</math></p> <p>3.9.5. The Domain and Image of a Function</p> <p>3.9.5.1. Concept and Characteristics</p> <p>3.9.5.2. Domain and Image Calculation</p>	<p><b>3.10. Derivatives: Behavior Analysis</b></p> <p>3.10.1. Derivatives of a Function at a Point</p> <p>3.10.1.1. Concept and Characteristics</p> <p>3.10.1.2. Geometric Interpretation</p> <p>3.10.2. Differentiation Rules</p> <p>3.10.2.1. Derivative of a Constant</p> <p>3.10.2.2. Derivative of a Sum or Differentiation</p> <p>3.10.2.3. Derivative of a Product</p> <p>3.10.2.4. Derivative of an Opposite Function</p> <p>3.10.2.5. Derivative of a Composite Function</p>



<b>3.11. Application of Derivatives to Study Functions</b> 3.11.1. Properties of Differentiable Functions 3.11.2. Valuation of Economic Quantities 3.11.3. Differentiable Functions	<b>3.12. Optimization of Functions of Several Variables</b> 3.12.1. Function Optimization 3.12.1.1. Optimization with Equality Constraint 3.12.1.2. Critical Points 3.12.1.3. Relative Extremes 3.12.2. Convex and Concave Functions 3.12.2.1. Properties of Convex and Concave Functions 3.12.2.2. Inflection Points 3.12.2.3. Growth and Decay	<b>3.13. Antiderivatives</b> 3.13.1. Antiderivatives 3.13.1.1. Basic Concepts 3.13.1.2. Calculation Methods 3.13.2. Immediate Integrals 3.13.2.1. Properties of Immediate Integrals 3.13.3. Integration Methods 3.13.3.1. Rational Integrals	<b>3.14. Definite Integrals</b> 3.14.1. Barrow's Fundamental Theorem 3.14.1.1. Definition of the Theorem 3.14.1.2. Calculation Basis 3.14.1.3. Applications of the Theorem 3.14.2. Curve Cutoff in Definite Integrals 3.14.2.1. Concept of Curve Cutoff 3.14.2.2. Calculation Basis and Operations Study 3.14.2.3. Applications of Curve Cutoff Calculation
3.14.3. Mean Value Theorem 3.14.3.1. Concept and Closed Interval Theorem 3.14.3.2. Calculation Basis and Operations Study 3.14.3.3. Applications of the Theorem			

## Module 4. Microeconomics

<b>4.1. Microeconomics: Welfare and Typology of Market Failures</b> 4.1.1. Microeconomics 4.1.1.1. Microeconomics Principles and Concepts 4.1.1.2. Production 4.1.1.3. Consumer Sovereignty 4.1.1.4. Economic Agents 4.1.2. Welfare and Typology of Failures 4.1.2.1. Concept of Welfare 4.1.2.2. Net Present Value 4.1.2.3. Types of Failures and Market Constraints	<b>4.2. Public Intervention. Externalities and Public Goods</b> 4.2.1. Public Intervention 4.2.1.1. The Existence of Public Goods 4.2.1.2. State Intervention 4.2.2. Externalities 4.2.2.1. Internal Costs 4.2.2.2. External Costs or Negative Externality 4.2.2.3. External Benefits 4.2.2.4. Environmental Policy	<b>4.3. Simultaneous Games: Normal Representation, Rationality and Information</b> 4.3.1. Simultaneous Games 4.3.1.1. Concept 4.3.1.2. Representation 4.3.1.3. Applications 4.3.2. Types of Simultaneous Games 4.3.2.1. Symmetrical and Asymmetrical Simultaneous Games 4.3.2.2. Other Types 4.3.3. History of Game Theory	<b>4.4. Dynamic Games: Extensive Representation, Perfect and Imperfect Information</b> 4.4.1. Extensive Form Representation 4.4.1.1. From Extensive to Normal Form: Strategy 4.4.2. Backward Introduction and Sub-Game Perfect Nash Equilibrium 4.4.2.1. Sequential Rationality and Nash Equilibrium 4.4.2.2. Backward Introduction Procedure 4.4.2.3. Sub-Games with Perfect Information 4.4.3. Stackelberg's Duopoly Model 4.4.3.1. Concept 4.4.3.2. Applications
<b>4.5. Oligopoly Characteristics and Models</b> 4.5.1. Oligopoly Characteristics 4.5.1.1. Conceptualization 4.5.1.2. Difference between Oligopoly and Monopoly 4.5.1.3. Business Interdependence 4.5.2. Oligopoly Models 4.5.2.1. Differentiated 4.5.2.2. Concentrated 4.5.2.3. Duopolies 4.5.3. Barriers to Market Entry 4.5.3.1. Oligopoly Practices 4.5.3.2. Causes and Consequences	<b>4.6. The Public Sector and Oligopolies</b> 4.6.1. Different Models 4.6.1.1. Cournot Competition Model 4.6.1.2. Stackelberg Competition Model 4.6.2. The Public Sector 4.6.2.1. Public Sectors and Innovation 4.6.2.2. Sector Failures 4.6.2.3. Oligopolies Worldwide	<b>4.7. Monopolistic Competition</b> 4.7.1. The Concept of Monopoly 4.7.1.1. Context 4.7.1.2. Concepts and Definitions 4.7.2. Characteristics of Markets 4.7.2.1. Examples of Markets 4.7.2.2. Imperfect Competition	<b>4.8. Differentiation, Equilibrium and Comparison between Perfect and Monopolistic Competition</b> 4.8.1. Differentiation 4.8.1.1. Concepts 4.8.1.2. Features 4.8.1.3. Highlights 4.8.2. Balance 4.8.2.1. Concept 4.8.2.2. Marginal Cost 4.8.2.3. Producers 4.8.3. Comparison

**4.9. Consumer Choice Theory**

- 4.9.1. Preferences
  - 4.9.1.1. Consumer Choice Theory
  - 4.9.1.2. Basket of Goods
  - 4.9.1.3. Preferences and Restrictions
  - 4.9.1.4. Binary Relation
- 4.9.2. Indifference Curve
  - 4.9.2.1. Concept and Definitions
  - 4.9.2.2. Curve Maps
- 4.9.3. Utility Function
  - 4.9.3.1. Concept and Definitions
  - 4.9.3.2. U-Level Functions
  - 4.9.3.3. Formulation and Types of Axioms

**4.10. Individual Demand Curves**

- 4.10.1. Individual Demand
  - 4.10.1.1. Conceptualization
  - 4.10.1.2. Examples
- 4.10.2. Demand Curves
  - 4.10.2.1. Conceptualization
  - 4.10.2.2. Determinants of Demand
  - 4.10.2.3. Change in the Amount of Demand
  - 4.10.2.4. Change in Demand

**4.11. Intertemporal Choice**

- 4.11.1. Intertemporal Preferences
  - 4.11.1.1. Marginal Rate of Time Preference (MRTP)
  - 4.11.1.2. Decreasing MRTP
  - 4.11.1.3. Current Period and Uncertainty
- 4.11.2. Interest Rate and Discounted Value
  - 4.11.2.1. Real Interest Rate
  - 4.11.2.2. Present Value
  - 4.11.2.3. Budget Constraint

**4.12. Social Choice under Uncertainty and Risk**

- 4.12.1. Risk Description
  - 4.12.1.1. Analysis of Decisions
  - 4.12.1.2. Expected Value
  - 4.12.1.3. Fair Play
  - 4.12.1.4. Variability
  - 4.12.1.5. Deviations
- 4.12.2. Risk Preferences
  - 4.12.2.1. Expected Utility
  - 4.12.2.2. Risk-Averse Individuals
  - 4.12.2.3. Risk-Neutral Individuals
  - 4.12.2.4. Risk-Loving Individuals
  - 4.12.2.5. Risk Premium and Value of Certainty

- 4.12.3. Risk Reduction
  - 4.12.3.1. Diversification
  - 4.12.3.2. Actuarial Justice
  - 4.12.3.3. Reservation Price

**4.13. Asymmetric Information**

- 4.13.1. Asymmetric Information
  - 4.13.1.1. Adverse Selection
  - 4.13.1.2. Moral Hazard
  - 4.13.1.3. Asymmetric Information Theory

**Module 5. Statistics I**

**5.1. Introduction to Statistics**

- 5.1.1. Basic Concepts
- 5.1.2. Types of Variables
- 5.1.3. Statistical Information

**5.2. Data Record Sorting and Classifying**

- 5.2.1. Description of Variables
- 5.2.2. Frequency Distribution Table
- 5.2.3. Quantitative and Qualitative Frequency Distribution Tables

**5.3. ICT Applications and Practical Systems**

- 5.3.1. Basic Concepts
- 5.3.2. Tools
- 5.3.3. Data Representation

**5.4. Summary Statistics I**

- 5.4.1. Descriptive Statistics
- 5.4.2. Centralization Measurements
- 5.4.3. Measures of Dispersion
- 5.4.4. Measures of Shape and Position

**5.5. Summary Statistics II**

- 5.5.1. Box Plots
- 5.5.2. Identifying Outliers
- 5.5.3. Transformation

**5.6. Statistical Analysis of the Relationship between the Two Variables**

- 5.6.1. Tabulation
- 5.6.2. Contingency Tables and Graphical Representations
- 5.6.3. Linear Relationship between Quantitative Variables

**5.7. Time Series and Index Numbers**

- 5.7.1. Time Series
- 5.7.2. Variation Rates
- 5.7.3. Index Numbers
- 5.7.4. Consumer Prices Index (CPI) and Deflated Time Series

**5.8. Introduction to Probability: Calculation and Basic Concepts**

- 5.8.1. Basic Concepts
- 5.8.2. Set Theory
- 5.8.3. Probability Calculation

**5.9. Random Variables and Probability Distributions**

- 5.9.1. Random Variables
- 5.9.2. Variable Measurements
- 5.9.3. Probability Distribution

**5.10. Probability Models for Random Variables**

- 5.10.1. Probability Calculation
- 5.10.2. Discrete Random Variables
- 5.10.3. Continuous Random Variables
- 5.10.4. Models Derived from Normal Distribution

**Module 6. Introduction to ICT**
**6.1. Information Systems: Features, Functions and Types**

- 6.1.1. Introduction to ICT
- 6.1.2. Principles
- 6.1.3. Features
- 6.1.4. Beginnings
- 6.1.5. Advantages and Disadvantages
- 6.1.6. Typology
- 6.1.7. Types of Information Systems
- 6.1.8. Business Processes

**6.2. Information Systems: Influence, Competitive Advantage and Strategies Based on Networks and Web 2.0**

- 6.2.1. ICT Influences
- 6.2.2. Current
- 6.2.3. Global
- 6.2.4. Competitive Advantages
- 6.2.5. Strategies Based on Web 2.0
- 6.2.6. Network Strategies

**6.3. Information and Communication Technologies (ICTs)**

- 6.3.1. Components
- 6.3.2. Concept
- 6.3.3. Types of Components
- 6.3.4. Applications
- 6.3.5. Infrastructure Evolution
- 6.3.6. History
- 6.3.7. Current Situation and Development
- 6.3.8. ICT Infrastructure Administration
- 6.3.9. Drivers
- 6.3.10. Administration

**6.4. Hardware and Trends**

- 6.4.1. Hardware
- 6.4.2. Concept
- 6.4.3. Hardware Evolution
- 6.4.4. Hardware and Software Classification
- 6.4.5. Hardware Trends
- 6.4.6. Data Processing
- 6.4.7. Accelerating Processes
- 6.4.8. Storing Processed Data
- 6.4.9. Graphic Visualization

**6.5. Integration of Processing and Telecommunication Platforms**

- 6.5.1. Integration
- 6.5.2. Conceptualization
- 6.5.3. Evolution
- 6.5.4. Business Interdependence
- 6.5.5. Integration and Competition
- 6.5.6. Integration Tools
- 6.5.7. Big Data

**6.6. Processing Modes, Virtualization and Multi-Core Processors**

- 6.6.1. Different Models
- 6.6.2. Multiprocessor Systems
- 6.6.3. Concept of Processing
- 6.6.4. Virtualization
- 6.6.5. Requirements
- 6.6.6. Hypervisors
- 6.6.7. Paravirtualization

**6.7. Software and Software Platforms**

- 6.7.1. Software
- 6.7.2. Context
- 6.7.3. Concepts and Definitions
- 6.7.4. Applications
- 6.7.5. Software Platforms
- 6.7.6. Current Platforms
- 6.7.7. The Evolution of Platforms

**6.8. Java and Enterprise Application Integration**

- 6.8.1. Java
- 6.8.2. Concepts
- 6.8.3. Features
- 6.8.4. Highlights
- 6.8.5. Business Applications Architecture
- 6.8.6. Concept
- 6.8.7. Integration in Companies
- 6.8.8. Transcoding
- 6.8.9. Adapting Semantic Content

**6.9. Networks: Corporate Networks and Connectivity Technologies**

- 6.9.1. Corporate Networks and Connectivity Technologies
- 6.9.2. Transformation
- 6.9.3. Connectivity in Companies
- 6.9.4. Connectivity Solutions
- 6.9.5. Transmission Types and Means
- 6.9.6. Concept and Definitions
- 6.9.7. Transmission Maps

**6.10. Internet, the Web, Web 2.0 and Web 3.0**

- 6.10.1. What Is the Internet?
- 6.10.2. Conceptualization
- 6.10.3. Applications
- 6.10.4. Web 1.0
- 6.10.5. Conceptualization
- 6.10.6. Static Content
- 6.10.7. Dissemination
- 6.10.8. Web 2.0
- 6.10.9. Conceptualization

- 6.10.10. Dynamic Content
- 6.10.11. Development
- 6.10.12. Web 3.0
- 6.10.13. Conceptualization
- 6.10.14. Multidevice Content
- 6.10.15. The Intelligent Web

**6.11. Business Tools for Communication and Coordination**

- 6.11.1. Business Tools
- 6.11.2. Distance Management
- 6.11.3. Planning Communication
- 6.11.4. Coordination Methods
- 6.11.5. International Coordination
- 6.11.6. International Coordination
- 6.11.7. Concept of Online

**6.12. Traditional File Organization, Data Management Systems, and Data Warehouses and Mining**

- 6.12.1. Data Storage.
- 6.12.2. Data Analysis
- 6.12.3. Types of Storage
- 6.12.4. Type of Storable Information
- 6.12.5. Data Variability
- 6.12.6. Data Management Systems
- 6.12.7. Balanced Scorecard
- 6.12.8. Planning Process

- 6.12.9. Management Indicators
- 6.12.10. Data Mining
- 6.12.11. Concept
- 6.12.12. Computational Complexity Theory
- 6.12.13. Trends

**6.13. Company Systems: Business Management and Decision Support Systems**

- 6.13.1. Decision Support Systems
- 6.13.2. Support Systems: DSS
- 6.13.3. Decision Making Based on Data Management
- 6.13.4. Business Management Processes
- 6.13.5. Concept of Management
- 6.13.6. Stages of the Process

**6.14. e-Commerce**

- 6.14.1. e-Commerce Significance
- 6.14.2. Concept
- 6.14.3. B2B
- 6.14.4. Implications
- 6.14.5. e-Commerce Challenges
- 6.14.6. Main Types of e-Commerce
- 6.14.7. Types of e-Commerce
- 6.14.8. Trading Markets
- 6.14.9. Evolution and Repercussion
- 6.14.10. Expansion
- 6.14.11. Global Repercussion

## Module 7. The Spanish Economy and World Economy

<b>7.1. An Overview of the Spanish Economy</b> 7.1.1. Assessment and Integration in the European Communities	<b>7.2. Production System: Structure and Sectoral Change</b> 7.2.1. Sectorial Evolution	<b>7.3. The External Sector in the Spanish Economy</b> 7.3.1. The Spanish External Sector	<b>7.4. The Public Sector in the Spanish Economy</b> 7.4.1. The Public Sector
<b>7.5. The Spanish Financial System</b> 7.5.1. The Financial System Structure and Monetary Policy	<b>7.6. The Labor Market in Spain</b> 7.6.1. Characteristics of the Labor Market	<b>7.7. International Development and Economic Challenges</b> 7.7.1. Challenges in our Century	<b>7.8. International Trade</b> 7.8.1. The Importance of International
<b>7.9. International Investment Flows</b> 7.9.1. Types, Trends and Financial Markets	<b>7.10. The International Financial and Monetary System</b> 7.10.1. Current System, Institutions and Globalization	<b>7.11. Economic Integration</b> 7.11.1. Process and Effects	<b>7.12. Economic Information Analysis</b> 7.12.1. Steps in the Analysis

## Module 8. Macroeconomics

<b>8.1. From Microeconomics to Macroeconomics. The Objectives of Macroeconomics</b> 8.1.1. Differences between Microeconomics 8.1.1.1. Concept and Analysis 8.1.1.2. Fundamental Processes 8.1.1.3. Comparative Analysis 8.1.2. Macroeconomic Objectives 8.1.2.1. Objectives 8.1.2.2. Objective Evolution	<b>8.2. Economic Policy Instruments</b> 8.2.1. Concept 8.2.1.1. Description 8.2.1.2. Evolution 8.2.2. Instruments 8.2.2.1. Institutions 8.2.2.2. Globalization 8.2.2.3. Detailed Analysis 8.2.3. International Instruments 8.2.3.1. Concepts and Definition 8.2.3.2. International Management	<b>8.3. Aggregate Production</b> 8.3.1. Aggregate Production Theory 8.3.1.1. Concepts 8.3.1.2. Origin of Theory 8.3.1.3. Applications 8.3.2. Aggregate Production Function 8.3.2.1. Yields and Constants 8.3.2.2. Production Factors 8.3.3. Applications	<b>8.4. Unemployment and Inflation Measurement</b> 8.4.1. Unemployment Measurement 8.4.1.1. Concept and Definitions 8.4.1.2. Unemployment Impacts 8.4.1.3. Measurement and Instruments 8.4.2. Inflation 8.4.2.1. Demand-Pull Inflation 8.4.2.2. Cost-Push Inflation 8.4.2.3. Structural Inflation
<b>8.5. The Demand for Goods: Consumption, Investment and Public Spending</b> 8.5.1. General Concepts 8.5.1.1. Important Definitions 8.5.1.2. The Consumer Market and Total Demand of Goods 8.5.2. The Components of GDP 8.5.2.1. Consumption 8.5.2.2. Investments 8.5.2.3. Public Spending	<b>8.6. Determination of Equilibrium Production</b> 8.6.1. Concepts 8.6.1.1. Definition and Characteristics 8.6.1.2. Differences between Savings and Investment 8.6.2. Profitability 8.6.2.1. Profitability Ratio 8.6.2.2. Stocks, Bonds and Mutual Funds 8.6.2.3. Introduction to Liquidity	<b>8.7. Money, Demand, Banking Systems and Money Supply</b> 8.7.1. Money 8.7.1.1. Functions 8.7.1.2. History and Evolution 8.7.1.3. Legal Tender 8.7.2. Money Creation Process 8.7.2.1. Money Supply 8.7.2.2. Liquid Assets	<b>8.8. Money Market Equilibrium: Determination of the Interest Rate</b> 8.8.1. Monetary Base 8.8.1.1. Money Creation 8.8.1.2. Money Destruction 8.8.2. Central Banks 8.8.2.1. Types of Rediscount 8.8.2.2. Open Market Operations 8.8.2.3. Monetary Policies

<p>8.8.3. Market Equilibrium                  8.8.3.1. The Keynesian and Neoclassical Schools of Thought                  8.8.3.2. LM (Liquidity-Money) Curve                  8.8.3.3. Curve Displacements</p>	<p><b>8.9. The Goods Market and the IS (Investment-Savings) Relationship, Financial Markets and the LM (Liquidity-Money) Relationship, the IS-LM Model.</b>                  8.9.1. The Goods Market and the IS Relationship                  8.9.1.1. Concepts and Definitions                  8.9.1.2. Basic Model                  8.9.1.3. Sales Level and Interest Rate</p>	<p>8.9.2. Financial Market and the LM Relationship                  8.9.2.1. Determination of Interest Rate                  8.9.2.2. The LM Relationship and LM Curve                  8.9.2.3. IS-LM Set Analysis</p>	<p><b>8.10. Fiscal Policy and Monetary Policy</b>                  8.10.1. Fiscal Policies                  8.10.1.1. Restrictive Policies                  8.10.1.2. Expansive Policies                  8.10.1.3. IS Curve Conditions                  8.10.2. Monetary Policies                  8.10.2.1. Restrictive and Expansive Policies                  8.10.2.2. LM Curve Conditions</p>
<p><b>8.11. The Goods Market Opening: Exports, Imports and Exchange Rates</b>                  8.11.1. Situation and Outlook                  8.11.1.1. Definition and Concepts                  8.11.1.2. Outlook Update                  8.11.2. Tools and Means                  8.11.2.1. Analysis Types and Structure                  8.11.2.2. Growth Indicators                  8.11.2.3. IMF Interventions</p>	<p><b>8.12. Financial Market Opening: Balance of Payments, the Relationship between Interest Rate and Exchange Rate</b>                  8.12.1. Balance of Payments                  8.12.1.1. Balance of Capital                  8.12.1.2. Balance of Trade and Services                  8.12.2. Type of Change                  8.12.2.1. Supply and Demand of Foreign Currencies                  8.12.2.2. Exchange Rate Regimes                  8.12.3. Sterilization Policies                  8.12.3.1. International Monetary Market                  8.12.3.2. Covered Interest Rate Parity</p>	<p><b>8.13. Equilibrium in Goods Market, Financial Markets and Aggregates in an Open Economy</b>                  8.13.1. IS Curve                  8.13.1.1. Part of the Economic Analysis                  8.13.1.2. Equilibrium                  8.13.2. LM Curve                  8.13.2.1. Part of the Economic Analysis                  8.13.2.2. Equilibrium</p>	<p><b>8.14. Changes in Domestic and Foreign Demand</b>                  8.14.1. Components                  8.14.1.1. Definitions                  8.14.1.2. Types of Demand                  8.14.1.3. Compensation Measures                  8.14.2. Macro-Compensation Components</p>
<p><b>8.15. The Effects of Fiscal Policy in an Open Economy</b>                  8.15.1. Open Economy Models                  8.15.1.1. Exports                  8.15.1.2. Imports                  8.15.1.3. Demand for Financial Assets</p>	<p>8.15.2. Foreign Exchange and Goods Market                  8.15.2.1. Definitions                  8.15.2.2.2. Global Effects in Economics</p>		

Module 9. Statistics II

**9.1. Probability: Random Variables**

- 9.1.1. Random Experiments
- 9.1.2. Axioms of Probability
- 9.1.3. Elementary Properties

**9.2. Probability Models**

- 9.2.1. Random Variables
- 9.2.2. Bernoulli's Distribution
- 9.2.3. Binomial Distribution
- 9.2.4. Multinomial Distribution

**9.3. Calculating Probabilities and Critical Points with R**

- 9.3.1. Normal or Gaussian Distribution
- 9.3.2. R Commander
- 9.3.3. Properties

**9.4. Statistical Inference: Some Preliminary Concepts**

- 9.4.1. Definition and Preliminary Concepts
- 9.4.2. Binomial Distribution and Calculation
- 9.4.3. Normal Curve and Calculation

**9.5. Point Estimators: Sampling Distributions and Properties**

- 9.5.1. General Concepts of Sampling Distribution
- 9.5.2. Point Estimation
- 9.5.3. Interval Estimation

**9.6. Confidence Intervals (CI): Mean, Proportion, Variance. CI in Two Populations**

- 9.6.1. Intervals for One or Several Samples
- 9.6.2. Bootstrap Method
- 9.6.3. Bayesian Intervals

**9.7. Hypothesis Testing in Statistical Inference Methods**

- 9.7.1. Statistical Hypothesis Testing
- 9.7.2. Region of Rejection and Acceptance
- 9.7.3. Decision Rules

**9.8. Particular Cases: Population Mean, Variance and Proportion. Parametric Contrasts**

- 9.8.1. Known and Unknown Variances
- 9.8.2. Likelihood Ratio
- 9.8.3. Equality Test

**9.9. Chi-Squared Goodness-of-Fit Test**

- 9.9.1. Data Grouping
- 9.9.2. Critical Region
- 9.9.3. Expected Frequency

**9.10. Normality Assumption Test: Jarque-Bera Test**

- 9.10.1. Significant Variables
- 9.10.2. Central Limit Theorem
- 9.10.3. Estimators, Histogram

**9.11. Hypothesis Test of Independence with Two Qualitative Variables**

- 9.11.1. Concept of Independent Variables
- 9.11.2. Observed and Expected Frequencies
- 9.11.3. Calculating the Contrast Ratio

**9.12. Simple Linear Regression Models and Point Estimation**

- 9.12.1. Regression and Linear Correlation Coefficient
- 9.12.2. Parameter Inference
- 9.12.3. Model Assumptions

**9.13. Confidence Interval and Regression Lines**

- 9.13.1. Linear Functions and Regression
- 9.13.2. Simple Linear Regression
- 9.13.3. Exogenous and Endogenous Variables

**9.14. Predictions and Applications of Information and Communication Technology**

- 9.14.1. Theoretical and Conceptual Framework
- 9.14.2. Collection and Analysis Techniques
- 9.14.3. General and Specific Objectives

**9.15. Multiple Regression Models and Point Estimation**

- 9.15.1. Hypothesis and Estimation
- 9.15.2. Types of Error and Model Adjustments
- 9.15.3. Linear Model Extensions

**9.16. Global Significance Test of Regression**

- 9.16.1. ANOVA Table
- 9.16.2. Multicollinearity

**Module 10. Econometrics****10.1. The Ordinary Least Squares (OLS) Method**

- 10.1.1. Linear Regression Models
- 10.1.2. Types of Content
- 10.1.3. General Line and OLS Estimation

**10.2. OLS Method in Other Scenarios**

- 10.2.1. Abandoning Basic Assumptions
- 10.2.2. Method Behavior
- 10.2.3. Effect of Measurement Changes

**10.3. Properties of OLS Estimators**

- 10.3.1. Moments and Properties
- 10.3.2. Variance Estimation
- 10.3.3. Matrix Forms

**10.4. OLS Variance Calculation**

- 10.4.1. Basic Concepts
- 10.4.2. Hypothesis Testing
- 10.4.3. Model Coefficients

**10.5. Hypothesis Testing in Linear Regression Models**

- 10.5.1. T-Contrast
- 10.5.2. F-Contrast
- 10.5.3. Global Contrasts

**10.6. Confidence Intervals**

- 10.6.1. Objectives
- 10.6.2. In a Coefficient
- 10.6.3. In a Combination of Coefficients

**10.7. Specification Problems**

- 10.7.1. Use and Concept
- 10.7.2. Types of Problems
- 10.7.3. Unobservable Explanatory Variables

**10.8. Prediction in Linear Regression Models**

- 10.8.1. Prediction
- 10.8.2. Average Value Intervals
- 10.8.3. Applications

**10.9. Residual Analysis in Linear Prediction**

- 10.9.1. Objectives and General Concepts
- 10.9.2. Analysis Tools
- 10.9.3. Waste Analysis

**10.10. Qualitative Variables in GLRM I**

- 10.10.1. Fundamentals
- 10.10.2. Models with Various Types of Information
- 10.10.3. Linear Metrics

**10.11. Qualitative Variables in GLRM II**

- 10.11.1. Binary Variables
- 10.11.2. Use of Dummy Variables
- 10.11.3. Time Series

**10.12. Autocorrelation**

- 10.12.1. Basic Concepts
- 10.12.2. Consequences
- 10.12.3. Contrast

**10.13. Heteroscedasticity**

- 10.13.1. Concept and Contrasts
- 10.13.2. Consequences
- 10.13.3. Time Series

# 06

# 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"*

## TECH Business School uses the 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”*



*This program prepares you to face business challenges in uncertain environments and achieve business success.*



*Our program prepares you to face new challenges in uncertain environments and achieve success in your career.*

### A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch to present executives with challenges and business decisions at the highest level, whether at the national or international level. 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 business reality is taken into account.

“

*You will learn, through collaborative activities and real cases, how to solve complex situations in real business environments”*

The case method has been the most widely used learning system among the world's leading business schools for as long as they have existed. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question we face in the case method, an action-oriented learning method. Throughout the program, the studies will be presented with multiple real cases. They must integrate all their knowledge, research, argue and defend their ideas and decisions.

## Relearning Methodology

TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

*Our online system will allow you to organize your time and learning pace, adapting it to your schedule. You will be able to access the contents from any device with an internet connection.*

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 online business school is the only one in the world licensed to incorporate 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.

With this methodology we have 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, markets, and financial 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 specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to 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.



### Management Skills Exercises

They will carry out activities to develop specific executive competencies in each thematic area. Practices and dynamics to acquire and develop the skills and abilities that a high-level manager needs to develop in the context of the globalization we live in.



### 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 senior management 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.



08

# Our Students' Profiles

The Executive Master's Degree in Business Economics and Statistics is a program aimed at Business Science professionals who want to update their knowledge in the field of Business Economics, and advance in their professional career towards a promising future in the field. The compendium of knowledge that they will acquire after completing this comprehensive specialization program will enable them to practice in the field with guarantees of success and to position themselves as experts in digital entrepreneurship.







“

*If you want to achieve an interesting career boost while continuing to work, then this is the program for you”*

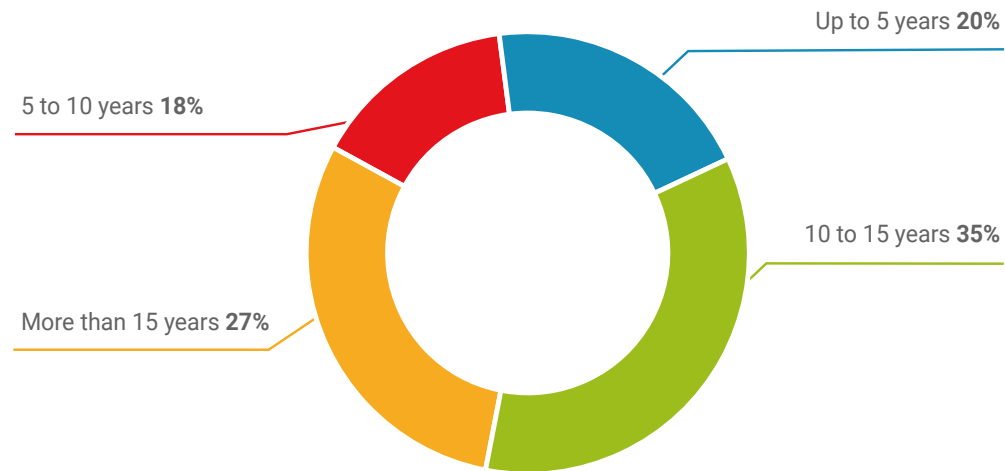
### Average Age

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Between **35** and **45** years old

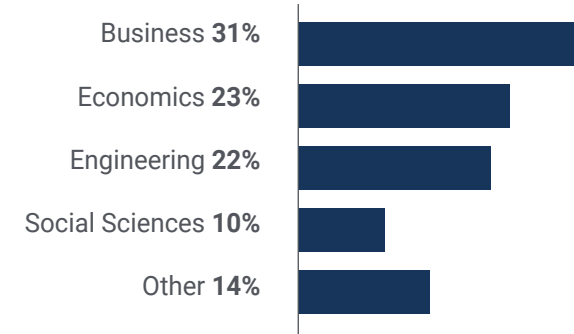
### Years of Experience

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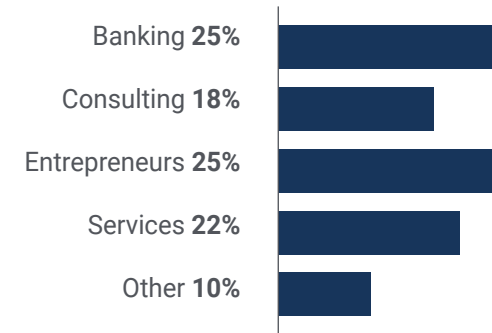
### Training

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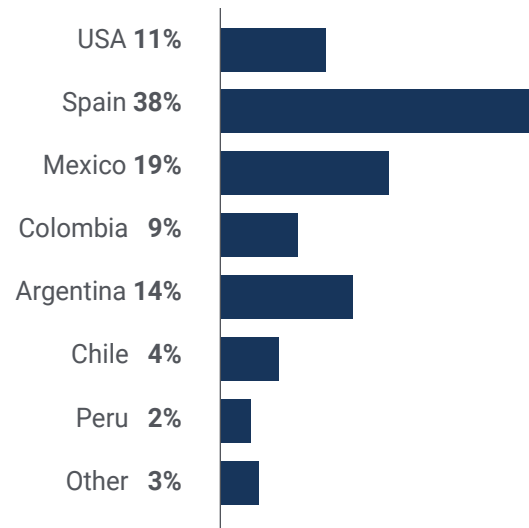
### Academic Profile

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## Geographical Distribution

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## Raquel Santana Pérez

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Manager

*"As a manager, I need to be constantly refreshing and updating my knowledge because, in a world that changes almost daily, knowing how the economy works is crucial for companies. This program has enabled me to do exactly that, and I now feel that I carry out my daily practice in a much more conscientious and efficient way"*

09

# Impact on Your Career

TECH is aware that studying a program like this entails great economic, professional and, of course, personal investment. The ultimate goal of this great effort should be to achieve professional growth. That is why TECH offers you all the tools you need to achieve the professional change you desire. A professional improvement that you will achieve with effort and hours of study.





“

*Our main challenge is to generate a positive change in your career path”*

### Are you ready to take the leap? Excellent professional development awaits you

With this program you will be able to drastically advance in your career, although there is no doubt that, in order to do so, you will have to make an investment in different areas, such as economic, professional and personal.

However, the goal is to improve in your professional life and, to do so, it is necessary to fight.

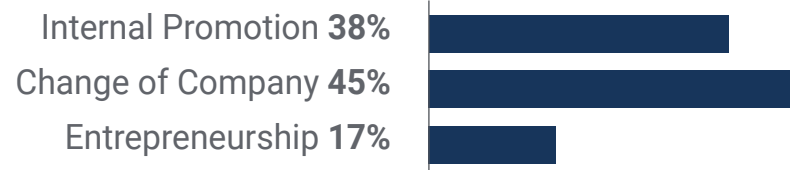
*TECH will help you boost your career in no time.*

*Thanks to this programme you will receive a large number of job offers with which you will be able to start your professional growth.*

#### When the change occurs



#### Type of change



### Salary increase

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This program represents a salary increase of more than **25.22%** for our students.



10

# Benefits for Your Company

The Executive Master's Degree in Business Economics and Statistics contributes to raising the organization's talent to its maximum potential through the specialization of high-level leaders.

Participating in this program is a unique opportunity to access a powerful network of contacts in which to find future professional partners, customers or suppliers.





“

*You will be able to contribute new concepts, strategies and perspectives to the company that can bring about essential changes in the organization”*

Developing and retaining talent in companies is the best long-term investment.

01

### Intellectual Capital and Talent Growth

Bring new concepts, strategies and perspectives to the company that can bring about relevant changes in the organization.

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02

### Retaining high-potential executives to avoid talent drain

This program strengthens the link between the company and the executive and opens new avenues for professional growth within the company.

03

### Building agents of change

You will be able to make decisions in times of uncertainty and crisis, helping the organization overcome obstacles.

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04

### Increased international expansion possibilities

Thanks to this program, the Organisation will come into contact with the main markets in the world economy.



05

### **Project Development**

Students will be able to work on a real project or develop new projects.

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06

### **Increased competitiveness**

This program will equip students with the skills to take on new challenges and drive the organization.

11

# Certificate

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





“

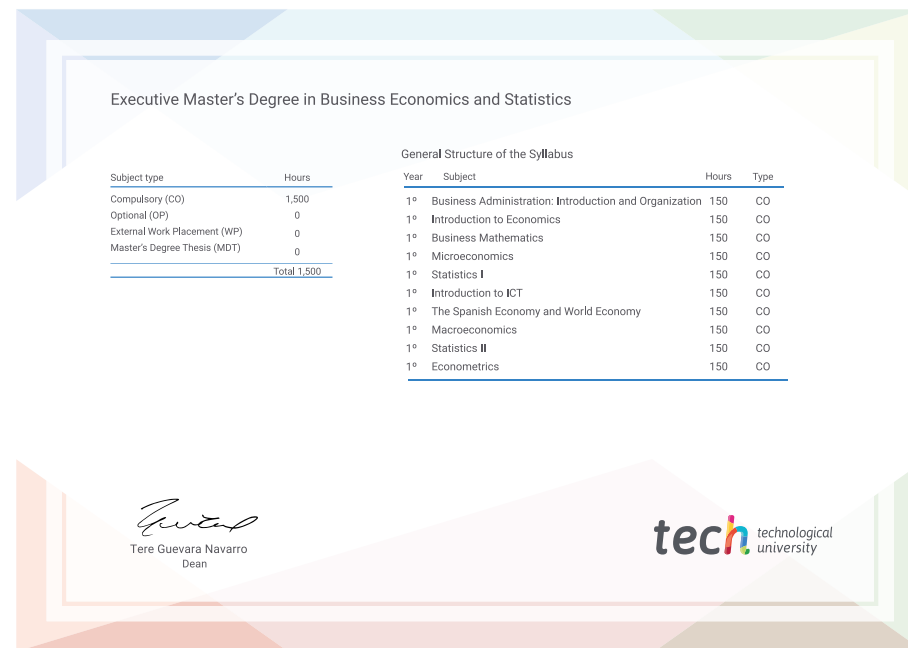
*Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"*

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

After the student has passed the assessments, they will receive their corresponding **Executive 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 Executive Master's Degree, and it meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Executive Master's Degree in Business Economics and Statistics**  
 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.



## Executive Master's Degree Business Economics and Statistics

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

# Executive Master's Degree Business Economics and Statistics

