Professional Master's Degree

Data Science Management (DSO, Data Science Officer)

tech technological university

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Professional Master's Degree
Data Science Management (DSO, Data Science Officer)

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

Website: www.techtitute.com/in/information-technology/professional-master-degree/master-data-science-management-dso-data-science-officer

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01

Introduction

The digital paradigm has finally been consolidated, which has revolutionized many industries. As a result, companies have seen the amount of data they handle multiply and, with this, new models have become necessary to ensure the effective and secure maintenance of this information. Under this premise, TECH launches this program especially aimed at all IT professionals who want to work as Data Science Officers (DSO), a highly-sought-after profile due to their ability not only to design a data flow strategy, but also to align resource use with the organization's strategy. Furthermore, this program stands out for its 100% online modality and its high-quality content presented in a convenient multimedia format specially designed to help consolidate knowledge from a practical perspective.

Maximize your professional potential by studying a program that will help you position yourself as a data science manager"

The program addresses data science from a technical and business perspective, and it offers all the necessary knowledge, allowing professionals to extract as much information as possible. Therefore, computer engineers or similar professionals interested in this area will be able to analyze in detail the different algorithms and platforms as well as the most modern tools used in data exploration, visualization, manipulation, processing and analysis. All of the above is complemented with the business skills required to reach an executive level profile capable of making key decisions in a company. The new multidisciplinary knowledge that students will acquire after completing the program will help them to position themselves as Data Science Officers (DSO) in companies of all sizes.

Similarly, the approach to data analysis from both perspectives makes this program a perfect educational experience that covers everything professionals that need to know in order to handle information and subsequently apply it as a fundamental asset for any organization.

The program will initially address the importance of using a good analysis system in the company, where each department can benefit. Likewise, specialized knowledge focused on the typology and life cycle of available resources will be developed, for which students will be instructed in basic statistics.

As the program progresses, students will be introduced to the models that present greater versatility and adaptability for the analysis of time series, such as the models associated to economic series. The program will lastly provide a wide variety of cases of use and cases where artificial intelligence and data science have been implemented in today's world.

With the Professional Master's Degree program, computer engineers will be able to specialize in Data Science, becoming the perfect opportunity to drive their professional career towards a managerial position in their respective departments. All this will be feasible thanks to a 100% online program, which adapts to the daily needs of its students. They will only require a device with an Internet connection to start developing a complete professional profile with international projection.

The **Professional Master's Degree in Data Science Management (DSO, Data Science Officer)** contains the most complete and up-to-date educational program on the market. The most important features include:

- Practical cases studies are presented by experts in Engineering in data analysis
- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- Practical exercises where self-assessment can be used to improve learning
- 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

If you are looking for a program that allows you to increase your skills and position yourself as a Data Science Officer (DSO) then then this is the course for you, in TECH you have found your place"

Prepare yourself to make decisions of scientific value and implement strategies that improve company department functions"

Empower your career by creating dashboards and KPIs depending on the department you work in.

Develop specialized knowledge related to data management and manipulation for Data Science processes. You will become a successful DSO.

The program's teaching staff includes professionals from the sector who contribute their work experience to this program, as well as renowned specialists from leading societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive knowledge 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 throughout the program. You will be assisted by an innovative, interactive video system made by renowned experts with extensive experience in Data Science Management and as Data Science Officers.

02

Objectives

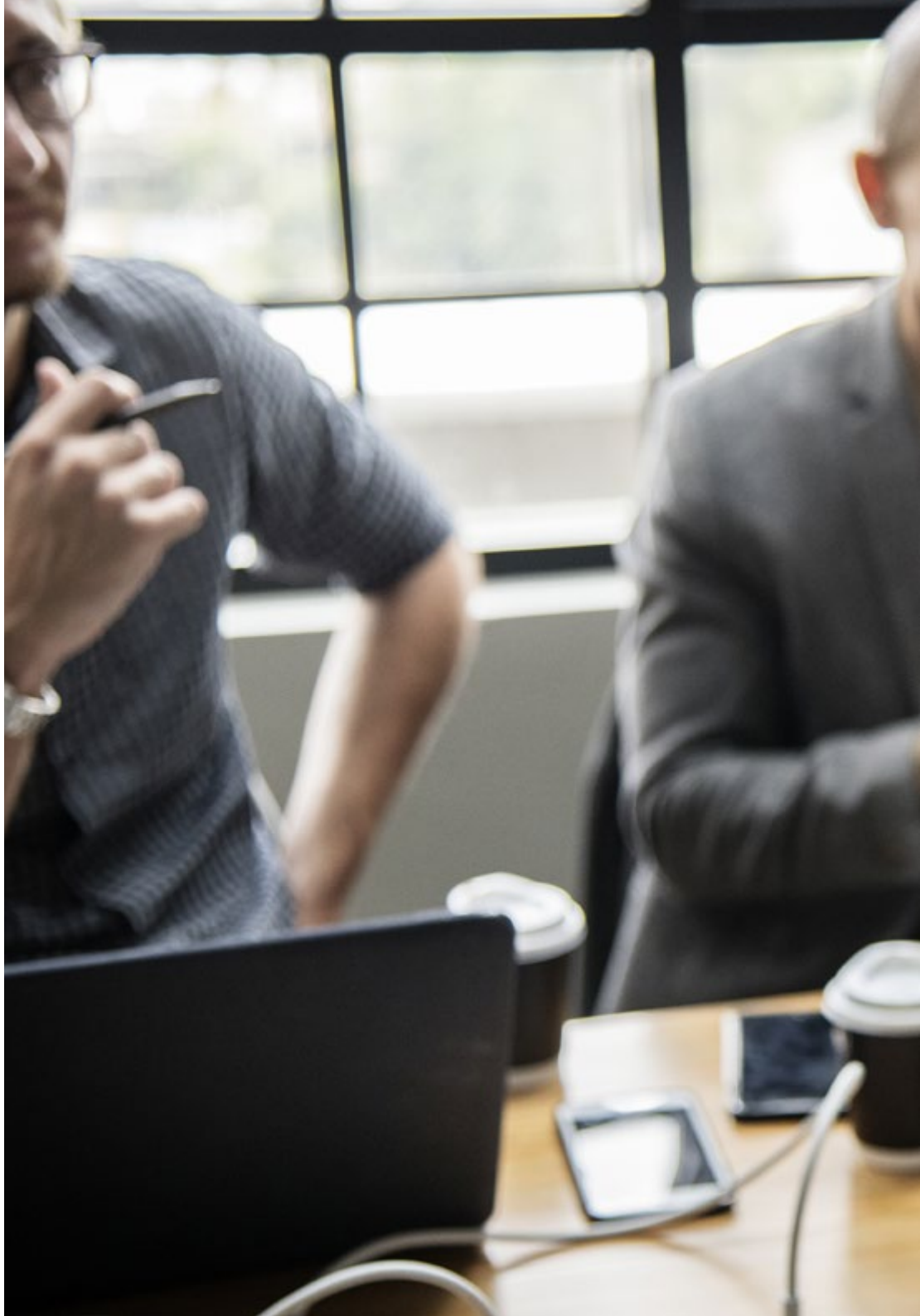
As we find ourselves in the data era, all the emerging new systems must be understood in terms of their technological implications. For this reason, computer engineers interested in reaching senior professional management positions must have all the appropriate knowledge to maximize data processing, not only from a technical perspective, but also from a business perspective. With this in mind, TECH has devised a program focused on the different techniques, technologies and phases necessary for data analytics and knowledge and value extraction, from a comprehensive and up-to-date perspective.

Your future starts here. Train as a data analytics specialist and position yourself as a senior manager”

General objectives

- Analyze the benefits of applying data analytics techniques in each department of the company
- Develop the basis for understanding the needs and applications of each department
- Generate specialized knowledge to select the right tool
- Propose techniques and objectives in order to be as productive as possible according to the department

Achieve your goals and reach excellence by completing a program that will enable you to generate specialized knowledge in data representation and analytics"



Specific objectives

Module 1. Data Analysis in a Business Organization

- Develop analytical skills in order to make quality decisions
- Examine effective marketing and communication campaigns
- Determine the creation of scorecards and KPIs according to the department
- Generate specialized knowledge to develop predictive analytics
- Propose business and loyalty plans based on market research
- Develop the ability to listen to the customer
- Apply statistical, quantitative and technical knowledge in real situations

Module 2. Data Management, Data Manipulation and Information Management for Data Science

- Perform data analyses
- Unify diverse data, achieving consistency of information
- Producing relevant, effective information for decision making
- Determine the best practices for data management according to its typology and uses
- Establish data access and reuse policies
- Ensure security and availability: information availability, integrity and confidentiality
- Examine data management tools using programming languages

Module 3. Devices and IoT Platforms as a Base for Data Science

- Define what is meant by IoT (Internet of Things) and IIoT (Industrial Internet of Things)
- Review the Industrial Internet Consortium
- Analyze what is the IoT reference architecture
- Address IoT sensors and devices and their classification
- Identify communications protocols and technologies used in IoT
- Examine the different IoT Cloud platforms: general purpose, industrial, open source
- Develop data exchange mechanisms
- Establish security requirements and strategies
- Present the different IoT and IIoT application areas

Module 4. Graphical Representation of Data Analysis

- Generate specialized knowledge in data analysis and representation
- Examine the different types of grouped data
- Establish the most-used graphic representations in different fields
- Determine the design principles in data visualization
- Introduce graphic narrative as a tool
- Analyze the different software tools for graphing and exploratory data analysis

Module 5. Data Science Tools

- Develop the skills to convert data into information from which knowledge can be extracted
- Determine the main features of a dataset, its structure, components and the implications of its distribution in the modeling
- Supporting decision making by performing comprehensive data analysis in advance
- Develop skills to solve practical cases using data science techniques
- Establish the most appropriate general tools and methods for modeling each Dataset based on the preprocessing performed
- Evaluate the results in an analytical way, understanding the impact of the chosen strategy on the various metrics
- Demonstrate critical analysis of the results obtained after applying preprocessing or modeling methods

Module 6. Data Mining: Selection, Pre-Processing and Transformation

- Generate specialized knowledge about the statistical prerequisites for any data analysis and evaluation
- Develop the necessary skills for data identification, preparation and transformation
- Evaluate the various methodologies presented and identify advantages and drawbacks
- Examine the problems in high dimensional data environments
- Implement algorithms used for data preprocessing
- Demonstrate the ability to interpret data visualization for descriptive analysis
- Develop advanced knowledge of the different existing data preparation techniques for data cleaning, normalization and transformation

Module 7. Predictability and Analysis of Stochastic Phenomena

- Analyze time series
- Develop the formulation and basic properties of univariate time series models
- Examine the methodology of modeling and prediction of real time series
- Assess univariate models including outliers
- Apply dynamic regression models and apply the methodology for the construction of such models from observed series
- Address the spectral analysis of univariate time series, as well as the fundamentals related to periodogram-based inference and interpretation
- Estimate the probability and trend in time series for a given time horizon

Module 8. Design and Development of Intelligent Systems

- Analyze the step from information to knowledge
- Develop the different types of machine learning
- Examine metrics and scores to quantify model quality
- Implement the different machine learning algorithms
- Identify probabilistic reasoning models
- Lay the foundations for deep learning
- Demonstrate the skills acquired to understand the various machine learning algorithms

Module 9. Architecture and Systems for Intensive Use of Data

- Determine the requirements for mass data usage systems
- Examine different data models and analyze databases
- Analyze the key functionalities for distributed systems and their importance in different types of systems
- Evaluate which widely used applications use the fundamentals of distributed systems to design their systems
- Analyze the way in which databases store and retrieve information
- Understand the different replication models and associated issues
- Develop partitioning and distributed transactions
- Assess batch systems and (near) real time systems

Module 10. Practical Application of Data Science in Business Sectors

- Analyze the state of the art of Artificial Intelligence (AI) and data analytics
- Develop specialized knowledge of the most widely used technologies
- Generate a better understanding of the technology through use cases
- Analyze the chosen strategies to select the best technologies to implement
- Determine the areas of application
- Examine the actual and potential risks of the technology used
- Propose benefits derived from the use
- Identify future trends in specific fields

03

Skills

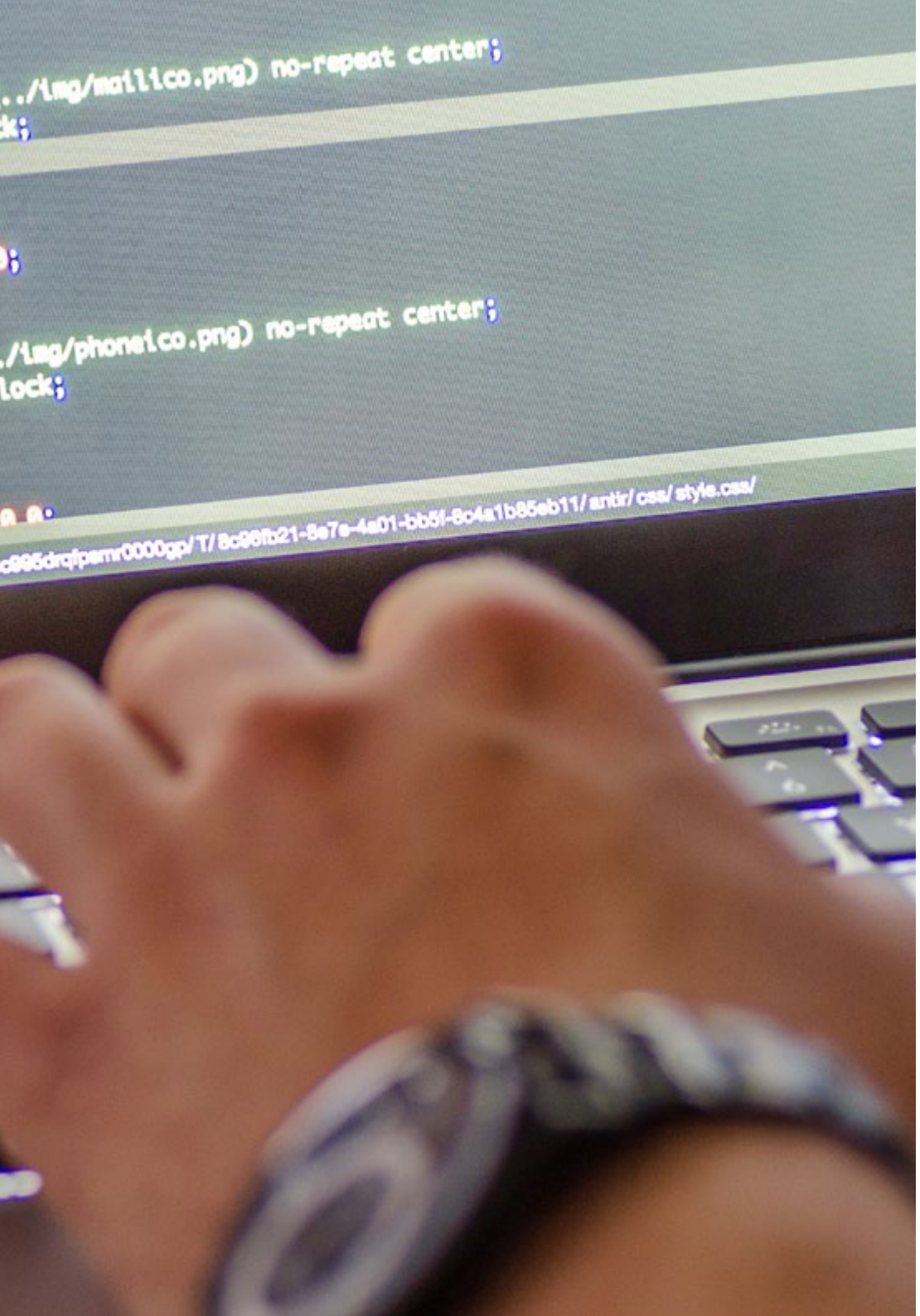
At the end of this Professional Master's Degree program in Data Science Management (DSO, Data Science Officer), professionals will be able to aspire to improve their daily work in this area of specialization. All this from a technical perspective of the profession, complemented by a business vision, which becomes an opportunity to offer valuable knowledge when making decisions that affect company department operations.

Acquire the necessary skills to take your career to the next level, visualizing data in the most appropriate way to favor sharing and understanding through different profiles"

General skills

- Develop a technical and business perspective of data analysis
- Understand the most current algorithms, platforms and tools for data exploration, visualization, manipulation, processing, and analysis
- Implement a business vision necessary for valorization as a key element for decision making
- Be able to address problems specific to data analysis

It makes this program the perfect opportunity to develop advanced knowledge of fundamental data mining techniques"



Specific skills

- Specialize in Data Science from a technical and business perspective
- Visualize data in the most appropriate way to favor data sharing and understanding for different profiles
- Address the key functional areas of the organization where data science can deliver the most value
- Develop knowledge of the data life cycle, its typology and the technologies and phases necessary for its management
- Process and manipulate data using specific languages and libraries
- Develop advanced knowledge in fundamental data mining techniques for data selection, preprocessing and transformation
- Specialize in the main Machine Learning algorithms for the extraction of hidden knowledge in data
- Generate specialized knowledge in the software architectures and systems required for intensive data use
- Determine how the IoT can be a source of data generation and key information on which to apply data science for knowledge extraction
- Analyze the different ways of applying data science in different sectors or verticals by learning from real examples

04

Course Management

TECH works exhaustively to guarantee that all its programs offer elite education. Therefore, it relies on renowned professionals who offer students their many years of experience and training. The Professional Master's Degree program in Data Science Management (DSO, Data Science Officer) has been designed according to the specifications of a group of highly qualified experts with extensive experience in the field. That is why computer engineers interested in this field can be sure to receive current and specific knowledge of this booming international field.

Succeed professionally and personally by learning from the best in the field of data analytics"

Management

Dr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometeus Global Solutions
- CTO at Korporate Technologies
- CTO in AI Shephers GmbH
- PhD in Psychology from the University of Castilla La Mancha
- PhD in Economics, Business and Finance from the Camilo José Cela University. Outstanding Award in his PhD
- PhD in Psychology, University of Castilla La Mancha
- Master's Degree in Advanced Information Technologies from the University of Castilla La Mancha
- Master MBA+E (Master's Degree in Business Administration and Organizational Engineering) from the University of Castilla La Mancha
- Associate lecturer, teaching undergraduate and master's degrees in Computer Engineering at the University of Castilla La Mancha
- Professor of the Master's Degree in Big Data and Data Science at the International University of Valencia
- Lecturer of the Master's Degree in Industry 4.0 and the Master's Degree in Industrial Design and Product Development
- Member of the SMILe Research Group of the University of Castilla La Mancha

Professors

Mr. Armero Fernández, Rafael

- Business Intelligence Consultant en SDG Group
- Digital Engineer en Mi-GSO
- Logistic Engineer en Torrecid S.A.
- Quality Intern at INDRA
- Degree in Aerospace Engineering from the Polytechnic University of Valencia
- Master's Degree in Professional Development 4.0 from the University of Alcalá de Henares

Ms. Martínez Cerrato, Yésica

- Electronic Security Product Technician at Securitas Security Spain
- Business Intelligence Analyst at Ricopia Technologies (Alcalá de Henares)
- Degree in Electronic Communications Engineering at the Polytechnic School, University of Alcalá
- Responsible for training new recruits on commercial management software (CRM, ERP, INTRANET), product and procedures in Ricopia Technologies (Alcalá de Henares)
- Responsible for training new scholarship holders incorporated to the Computer Classrooms at the University of Alcalá
- Project Manager in the area of Key Accounts Integration at Correos and Telégrafos (Madrid)
- Computer Technician-Responsible for computer classrooms OTEC, University of Alcalá (Alcalá de Henares)
- Computer classes teacher at ASALUMA Association (Alcalá de Henares)
- Scholarship for Training as a Computer Technician in OTEC, University of Alcala (Alcalá de Henares)

Mr. Montoro Montarroso, Andrés

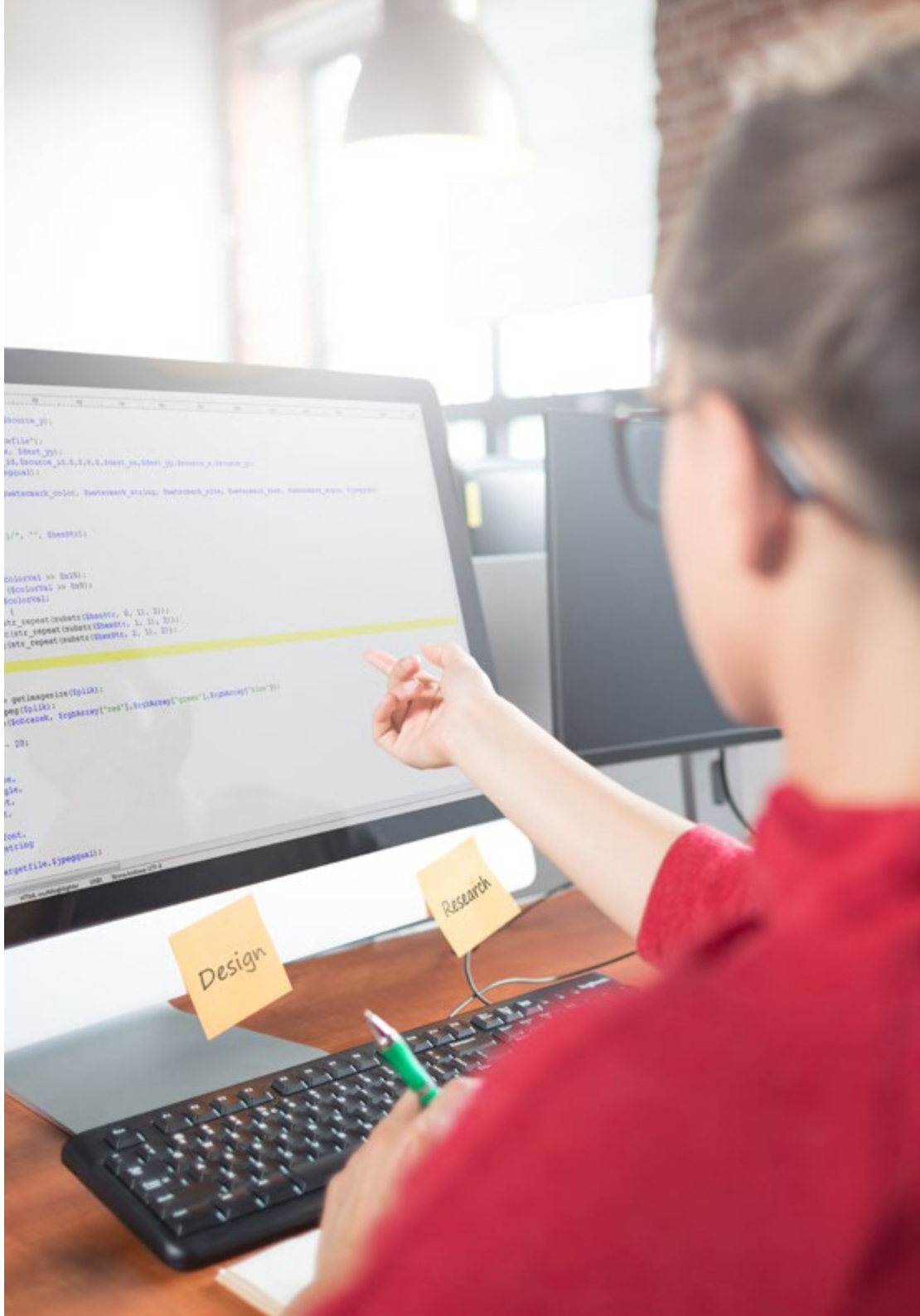
- Researcher in the SMILe Group at the University of Castilla La Mancha
- Data Scientist at Prometeus Global Solutions
- Graduate in Computer Engineering from the University of Castilla La Mancha
- Master's Degree in Data Science and Computer Engineering from the University of Granada
- Guest lecturer in the subject of Knowledge-Based Systems at the Escuela Superior de Informática de Ciudad Real, Giving the Lecture "Advanced Artificial Intelligence Techniques: Search and Analysis of Potential Social Media Radicals"
- Guest lecturer in the subject of Data Mining at the Escuela Superior de Informática de Ciudad Real giving the lecture: "Applications of Natural Language Processing: Fuzzy Logic to the Analysis of Messages in Social Networks"
- Speaker at the Seminar on Corruption Prevention in Public Administrations and Artificial Intelligence. Faculty of Law and Social Sciences of Toledo. Conference entitled "Artificial Intelligence Techniques". Speaker at the first International Seminar on Administrative Law and Artificial Intelligence (DAIA). Organized by Centro de Estudios Europeos Luis Ortega Álvarez and Institut de Recerca TransJus. Conference entitled "Sentiment Analysis for the Prevention of Hate Speech on Social Media"

Mr. Peris Morillo, Luis Javier

- Technical Lead in Capitole Consulting. He leads a team at Inditex in the logistics unit of its open platform
- Senior Technical Lead and Delivery Lead Support in HCL
- Agile Coach and Director of Operations at Mirai Advisory
- Member of the Steering Committee as Chief Operating Officer
- Developer, Team Lead, Scrum Master, Agile Coach, Product Manager in DocPath
- Senior Engineering in Computer Science from the ESI of Ciudad Real (UCLM)
- Postgraduate degree in Project Management by the CEOE - Spanish Confederation of Business Organizations
- 50+ MOOCs taken, taught by renowned universities such as Stanford University, Michigan University, Yonsei University, Polytechnic University of Madrid, etc.
- Several certifications, some of the most notable or recent ones are Azure Fundamentals

Ms. Rissanen, Karoliina

- Responsible for the development of training programs Professional Experience
- HR Specialist, Oy Sinebrychoff Ab (Carlsberg Group)
- Assistant Manager, People, Performance and Development, IATA Global Delivery Center
- Assistant Manager, Customer Services, IATA Global Delivery Center
- Trained and Certified as an instructor for IATA
- Training of customer service personnel
- Diploma in Tourism from Haaga-Helia University
- Master's Degree in Protocol and External Relations from Camilo José Cela University
- Diploma in Human Resources Management from Chartered Institute of Personnel and Development



Ms. Fernández Meléndez, Galina

- Data Analyst in ADN Mobile Solution
- ETL processes, data mining, data analysis and visualization, establishment of KPI's, Dashboard design and implementation, management control. ADN Mobile Solution-Gijón-Spain R development, SQL management, among others
- Pattern determination, predictive modelling, machine learning
- Bachelor's degree in Business Administration. Bicentenaria de Aragua-Caracas University
- Diploma in Planning and Public Finance Venezuelan School of Planning, School of Finance
- Professional Master's Degree in Data Analysis and Business Intelligence, University of Oviedo
- MBA in Business Administration and Management (Escuela De Negocios Europea De Barcelona)
- Master's Degree in Big Data and Business Intelligence (Escuela de Negocios Europea de Barcelona)

Mr. Martín-Palomino Sahagún, Fernando

- CTO at AURA Diagnostics (medTech)
- Business Development Spain SARLIN, Industry 4.0 applied compressed air
- Operations Management Alliance Diagnostics
- Manager at Innovation Alliance Medical
- CIO at Alliance Medical
- Field Engineer & Digital Radiology Project Management at Kodak
- Head Telecommunications Engineer MBA at Polytechnic University of Madrid
- Executive Master's Degree in Marketing and Sales, ESADE Teaching Experience
- Training of medical personnel in the use of new technologies for digital diagnostics
- Training of industrial plant personnel in the use of 4.0 applications

Mr. Tato Sánchez, Rafael

- Project Management INDRA SISTEMAS S.A.
- Technical Director INDRA SISTEMAS S.A.
- Systems Engineer ENA TRÁFICO S.A.U.
- IFCD048PO. Software Project Management and Development Methodology with SCRUM
- Course: Machine Learning
- Udemy: Deep Learning A-Z. Hands-on Artificial Neural Networks
- Coursera: IBM: Fundamentals of Scalable Data Science
- Coursera: IBM: Applied AI with Deep Learning
- Coursera: IBM: Advance Machine Learning and Signal Processing
- Degree in Industrial Electronics and Automation Engineering from the European University of Madrid
- Master's Degree in Industrial Engineering from the European University of Madrid
- Master's Degree in Industry 4.0 from the International University of La Rioja (UNIR)
- Professional certification. SSCE0110. Teaching for vocational training for employment

Ms. Pedrajas Perabá, María Elena

- Business Analyst in Management Solutions in Madrid
- Collaborator with the Department of Numerical Analysis at the University of Cordoba Professional Experience
- Researcher in the Department of Computer Science and Numerical Analysis at the University of Cordoba
- Researcher at the Singular Center for Research in Intelligent Technologies in Santiago de Compostela
- Degree in Computer Engineering
- Master's Degree in Data Science and Computer Engineering Teaching Experience

05

Structure and Content

In a world dominated by data, it is important to know the main systems that are responsible for generating and storing it for further analysis. Therefore, a program has been designed to meet the preparatory requirements of professionals who wish to specialize in the most complete and current techniques used in data processing and knowledge extraction, from both a theoretical and practical perspective. As a result, computer engineers will be able to advance their technical knowledge while also developing a business profile.

Generate specialized knowledge in the software architectures and systems required for intensive data use"

Module 1. Data Analysis in a Business Organization

1.1. Business Analysis
- 1.1.1. Business Analysis
- 1.1.2. Data Structure
- 1.1.3. Phases and Elements

1.2. Data Analysis in the Business
- 1.2.1. Departmental Scorecards and KPIs
- 1.2.2. Operational, Tactical and Strategic Reports
- 1.2.3. Data Analytics Applied to Each Department
  - 1.2.3.1. Marketing and Communication
  - 1.2.3.2. Commercial
  - 1.2.3.3. Customer Service
  - 1.2.3.4. Purchasing
  - 1.2.3.5. Administration
  - 1.2.3.6. HR
  - 1.2.3.7. Production
  - 1.2.3.8. IT

1.3. Marketing and Communication
- 1.3.1. KPIs to be Measured, Applications and Benefits
- 1.3.2. Marketing Systems and Data Warehouse
- 1.3.3. Implementation of a Data Analytics Framework in Marketing
- 1.3.4. Marketing and Communication Plan
- 1.3.5. Strategies, Prediction and Campaign Management

1.4. Commerce and Sales
- 1.4.1. Contributions of Data Analytics in the Commercial Area
- 1.4.2. Sales Department Nees
- 1.4.3. Market Research

1.5. Customer Service
- 1.5.1. Loyalty
- 1.5.2. Personal Coaching and Emotional Intelligence
- 1.5.3. Customer Satisfaction

1.6. Purchasing
- 1.6.1. Data Analysis for Market Research
- 1.6.2. Data Analysis for Competency Research
- 1.6.3. Other Applications

1.7. Administration
- 1.7.1. Needs of the Administration Department
- 1.7.2. Data Warehouse and Financial Risk Analysis
- 1.7.3. Data Warehouse and Credit Risk Analysis

1.8. Human Resources
- 1.8.1. HR and the Benefits of Data Analysis
- 1.8.2. Data Analytics Tools in the HR Department
- 1.8.3. Data Analytics Applications in the HR Department

1.9. Production
- 1.9.1. Data Analysis in a Production Department
- 1.9.2. Applications
- 1.9.3. Benefits

1.10. IT
- 1.10.1. IT Department
- 1.10.2. Data Analysis and Digital Transformation
- 1.10.3. Innovation and Productivity

Module 2. Data and Information Management and Manipulation in Data Science

2.1. Statistics. Variables, Indices and Ratios
- 2.1.1. Statistics
- 2.1.2. Statistical Dimensions
- 2.1.3. Variables, Indices and Ratios

2.2. Type of Data
- 2.2.1. Qualitative
- 2.2.2. Quantitative
- 2.2.3. Characterization and Categories

2.3. Data Knowledge from the Measurements
- 2.3.1. Centralization Measurements
- 2.3.2. Measures of Dispersion
- 2.3.3. Correlation

2.4. Data Knowledge from the Graphs
- 2.4.1. Visualization According to Type of Data
- 2.4.2. Interpretation of Graphic Information
- 2.4.3. Customization of Graphics with R

2.5. Probability
- 2.5.1. Probability
- 2.5.2. Function of Probability
- 2.5.3. Distributions

2.6. Data Collection
- 2.6.1. Methodology of Data Collection
- 2.6.2. Data Collection Tools
- 2.6.3. Data Collection Channels

2.7. Data Cleaning
- 2.7.1. Phases of Data Cleansing
- 2.7.2. Data Quality
- 2.7.3. Data Manipulation (with R)

2.8. Data Analysis, Interpretation and Evaluation of Results
- 2.8.1. Statistical Measures
- 2.8.2. Relationship Indices
- 2.8.3. Data Mining

2.9. Data Warehouse
- 2.9.1. Components
- 2.9.2. Design

2.10. Data Availability
- 2.10.1. Access
- 2.10.2. Uses
- 2.10.3. Security

Module 3. Devices and IoT Platforms as a Base for Data Science

3.1. Internet of Things
- 3.1.1. Internet of the Future, Internet of Things
- 3.1.2. The Industrial Internet Consortium

3.2. Architecture of Reference
- 3.2.1. The Architecture of Reference
- 3.2.2. Layers
- 3.2.3. Components

3.3. Sensors and IoT Devices
- 3.3.1. Principal Components
- 3.3.2. Sensors and Actuators

3.4. Communications and Protocols
- 3.4.1. Protocols. OSI Model
- 3.4.2. Communication Technologies

3.5. Cloud Platforms for IoT and IIoT
- 3.5.1. General Purpose Platforms
- 3.5.2. Industrial Platforms
- 3.5.3. Open Code Platforms

3.6. Data Management on IoT Platforms
- 3.6.1. Data Management Mechanisms. Open Data
- 3.6.2. Data Exchange and Visualization

3.7. IoT Security
- 3.7.1. Requirements and Security Areas
- 3.7.2. Security Strategies in IIoT

3.8. Applications of IoT
- 3.8.1. Intelligent Cities
- 3.8.2. Health and Fitness
- 3.8.3. Smart Home
- 3.8.4. Other Applications

3.9. Applications of IIoT
- 3.9.1. Fabrication
- 3.9.2. Transport
- 3.9.3. Energy
- 3.9.4. Agriculture and Livestock
- 3.9.5. Other Sectors

3.10. Industry 4.0
- 3.10.1. IoRT (Internet of Robotic Things)
- 3.10.2. 3D Additive Manufacturing
- 3.10.3. Big Data Analytics

Module 4. Graphical Representation of Data Analysis

4.1. Exploratory Analysis
- 4.1.1. Representation for Information Analysis
- 4.1.2. The Value of Graphical Representation
- 4.1.3. New Paradigms of Graphical Representation

4.2. Optimization for Data Science
- 4.2.1. Color Range and Design
- 4.2.2. Gestalt in Graphic Representation
- 4.2.3. Errors to Avoid and Advice

4.3. Basic Data Sources
- 4.3.1. For Quality Representation
- 4.3.2. For Quantity Representation
- 4.3.3. For Time Representation

4.4. Complex Data Sources
- 4.4.1. Files, Lists and Databases
- 4.4.2. Open Data
- 4.4.3. Continuous Data Generation

4.5. Types of Graphs
- 4.5.1. Basic Representations
- 4.5.2. Block Representation
- 4.5.3. Representation for Dispersion Analysis
- 4.5.4. Circular Representations
- 4.5.5. Bubble Representations
- 4.5.6. Geographical Representations

4.6. Types of Visualization
- 4.6.1. Comparative and Relational
- 4.6.2. Distribution
- 4.6.3. Hierarchical

4.7. Report Design with Graphic Representation
- 4.7.1. Application of Graphs in Marketing Reports
- 4.7.2. Application of Graphs in Scorecards and KPIs
- 4.7.3. Application of Graphs in Strategic Plans
- 4.7.4. Other Uses: Science, Health, Business

4.8. Graphic Narration
- 4.8.1. Graphic Narration
- 4.8.2. Evolution
- 4.8.3. Uses

4.9. Tools Oriented Towards Visualization
- 4.9.1. Advanced Tools
- 4.9.2. Online Software
- 4.9.3. Open Source

4.10. New Technologies in Data Visualization
- 4.10.1. Systems for Virtualization of Reality
- 4.10.2. Reality Enhancement and Improvement Systems
- 4.10.3. Intelligent Systems

Module 5. Data Science Tools

5.1. Data Science
- 5.1.1. Data Science
- 5.1.2. Advanced Tools for Data Scientists

5.2. Data, Information and Knowledge
- 5.2.1. Data, Information and Knowledge
- 5.2.2. Types of Data
- 5.2.3. Data Sources

5.3. From Data to Information
- 5.3.1. Data Analysis
- 5.3.2. Types of Analysis
- 5.3.3. Extraction of Information from a Dataset

5.4. Extraction of Information Through Visualization
- 5.4.1. Visualization as an Analysis Tool
- 5.4.2. Visualization Methods
- 5.4.3. Visualization of a Data Set

5.5. Data Quality
- 5.5.1. Quality Data
- 5.5.2. Data Cleaning
- 5.5.3. Basic Data Pre-Processing

5.6. Dataset
- 5.6.1. Dataset Enrichment
- 5.6.2. The Curse of Dimensionality
- 5.6.3. Modification of Our Data Set

5.7. Unbalance
- 5.7.1. Classes of Unbalance
- 5.7.2. Unbalance Mitigation Techniques
- 5.7.3. Balancing a Dataset

5.8. Unsupervised Models
- 5.8.1. Unsupervised Model
- 5.8.2. Methods
- 5.8.3. Classification with Unsupervised Models

5.9. Supervised Models
- 5.9.1. Supervised Model
- 5.9.2. Methods
- 5.9.3. Classification with Supervised Models

5.10. Tools and Good Practices
- 5.10.1. Good Practices for Data Scientists
- 5.10.2. The Best Model
- 5.10.3. Useful Tools

Module 6. Data Mining: Selection, Pre-Processing and Transformation

6.1. Statistical Inference
- 6.1.1. Descriptive Statistics vs. Statistical Inference
- 6.1.2. Parametric Procedures
- 6.1.3. Non-Parametric Procedures

6.2. Exploratory Analysis
- 6.2.1. Descriptive Analysis
- 6.2.2. Visualization
- 6.2.3. Data Preparation

6.3. Data Preparation
- 6.3.1. Integration and Data Cleaning
- 6.3.2. Normalization of Data
- 6.3.3. Transforming Attributes

6.4. Missing Values
- 6.4.1. Treatment of Missing Values
- 6.4.2. Maximum Likelihood Imputation Methods
- 6.4.3. Missing Value Imputation Using Machine Learning

6.5. Noise in the Data
- 6.5.1. Noise Classes and Attributes
- 6.5.2. Noise Filtering
- 6.5.3. The Effect of Noise

6.6. The Curse of Dimensionality
- 6.6.1. Oversampling
- 6.6.2. Undersampling
- 6.6.3. Multidimensional Data Reduction

6.7. From Continuous to Discrete Attributes
- 6.7.1. Continuous Data vs. Discreet Data
- 6.7.2. Discretization Process

6.8. The Data
- 6.8.1. Data Selection
- 6.8.2. Prospects and Selection Criteria
- 6.8.3. Selection Methods

6.9. Instance Selection
- 6.9.1. Methods for Instance Selection
- 6.9.2. Prototype Selection
- 6.9.3. Advanced Methods for Instance Selection

6.10. Data Pre-Processing in Big Data Environments
- 6.10.1. Big Data
- 6.10.2. Classical Versus Massive Pre-processing
- 6.10.3. Smart Data

Module 7. Predictability and Analysis of Stochastic Phenomena

7.1. Time Series
- 7.1.1. Time Series
- 7.1.2. Utility and Applicability
- 7.1.3. Related Case Studies

7.2. Time Series
- 7.2.1. Seasonal Trend of ST
- 7.2.2. Typical Variations
- 7.2.3. Waste Analysis

7.3. Types
- 7.3.1. Stationary
- 7.3.2. Non-Stationary
- 7.3.3. Transformations and Settings

7.4. Time Series Schemes
- 7.4.1. Additive Scheme (Model)
- 7.4.2. Multiplicative Scheme (Model)
- 7.4.3. Procedures to Determine the Type of Model

7.5. Basic Forecasting Methods
- 7.5.1. Media
- 7.5.2. Naïve
- 7.5.3. Seasonal Naïve
- 7.5.4. Method Comparison

7.6. Waste Analysis
- 7.6.1. Autocorrelation
- 7.6.2. ACF of Waste
- 7.6.3. Correlation Test

7.7. Regression in the Context of Time Series
- 7.7.1. ANOVA
- 7.7.2. Fundamentals
- 7.7.3. Practical Applications

7.8. Predictive Methods of Time Series
- 7.8.1. ARIMA
- 7.8.2. Exponential Smoothing

7.9. Manipulation and Analysis of Time Series with R
- 7.9.1. Data Preparation
- 7.9.2. Identification of Patterns
- 7.9.3. Model Analysis
- 7.9.4. Prediction

7.10. Combined Graphical Analysis with R
- 7.10.1. Normal Situations
- 7.10.2. Practical Application for the Resolution of Simple Problems
- 7.10.3. Practical Application for the Resolution of Advanced Problems

Module 8. Design and Development of Intelligent Systems

8.1. Data Pre-Processing
- 8.1.1. Data Pre-Processing
- 8.1.2. Data Transformation
- 8.1.3. Data Mining

8.2. Machine Learning
- 8.2.1. Supervised and Unsupervised Learning
- 8.2.2. Reinforcement Learning
- 8.2.3. Other Learning Paradigms

8.3. Classification Algorithms
- 8.3.1. Inductive Machine Learning
- 8.3.2. SVM and KNN
- 8.3.3. Metrics and Scores for Ranking

8.4. Regression Algorithms
- 8.4.1. Lineal Regression, Logistical Regressiona and Non-Lineal Models
- 8.4.2. Time Series
- 8.4.3. Metrics and Scores for Regression

8.5. Clustering Algorithms
- 8.5.1. Hierarchical Clustering Techniques
- 8.5.2. Partitional Clustering Techniques
- 8.5.3. Metrics and Scores for Clustering

8.6. Association Rules Techniques
- 8.6.1. Methods for Rule Extraction
- 8.6.2. Metrics and Scores for Association Rule Algorithms

8.7. Advanced Classification Techniques. Multiclassifiers
- 8.7.1. Bagging Algorithms
- 8.7.2. Random "Forests Sorter"
- 8.7.3. "Boosting" for Decision Trees

8.8. Probabilistic Graphical Models
- 8.8.1. Probabilistic Models
- 8.8.2. Bayesian Networks. Properties, Representation and Parameterization
- 8.8.3. Other Probabilistic Graphical Models

8.9. Neural Networks
- 8.9.1. Machine Learning with Artificial Neural Networks
- 8.9.2. Feed-Forward Networks

8.10. Deep Learning
- 8.10.1. Deep Feed Forward Networks
- 8.10.2. Convolutional Neural Networks and Sequence Models
- 8.10.3. Tools for Implementing Deep Neural Networks

Module 9. Architecture and Systems for Intensive Use of Data

9.1. Non-Functional Requirements: Pillars of Big Data Applications
- 9.1.1. Reliability
- 9.1.2. Adaptation
- 9.1.3. Maintainability

9.2. Data Models
- 9.2.1. Relational Model
- 9.2.2. Document Model
- 9.2.3. Graph Type Data Model

9.3. Databases: Storage Management and Data Recovery
- 9.3.1. Hash Indexes
- 9.3.2. Structured Log Storage
- 9.3.3. B-Trees

9.4. Data Coding Formats
- 9.4.1. Language-Specific Formats
- 9.4.2. Standardized Formats
- 9.4.3. Binary Coding Formats
- 9.4.4. Data Stream Between Processes

9.5. Replication
- 9.5.1. Objectives of Replication
- 9.5.2. Replication Models
- 9.5.3. Problems with Replication

9.6. Distributed Transactions
- 9.6.1. Transaction
- 9.6.2. Protocols for Distributed Transactions
- 9.6.3. Serializable Transactions

9.7. Partitions
- 9.7.1. Forms of Partitioning
- 9.7.2. Secondary Index Interaction and Partitioning
- 9.7.3. Partition Rebalancing

9.8. Processing of Offline Data
- 9.8.1. Batch Processing
- 9.8.2. Distributed File Systems
- 9.8.3. MapReduce

9.9. Data Processing in Real Time
- 9.9.1. Types of Message Broker
- 9.9.2. Representation of Databases as Data Streams
- 9.9.3. Data Stream Processing

9.10. Practical Applications in Business
- 9.10.1. Consistency in Readings
- 9.10.2. Holistic Focus of Data
- 9.10.3. Scaling of a Distributed Service

Module 10. Practical Application of Data Science in Business Sectors

10.1. Health Sector
- 10.1.1. Implications of AI and Data Analysis in the Health Sector
- 10.1.2. Opportunities and Challenges

10.2. Risks and Trends in the Health Sector
- 10.2.1. Use in the Health Sector
- 10.2.2. Potential Risks Related to the Use of AI

10.3. Financial Services
- 10.3.1. Implications of AI and Data Analysis in the Financial Services Sector
- 10.3.2. Use in the Financial Services
- 10.3.3. Potential Risks Related to the Use of AI

10.4. Retail
- 10.4.1. Implications of AI and Data Analysis in the Retail Sector
- 10.4.2. Use in Retail
- 10.4.3. Potential Risks Related to the Use of AI

10.5. Industry 4.0
- 10.5.1. Implications of AI and Data Analysis in Industry 4.0
- 10.5.2. Use in the 4.0 Industry

10.6. Risks and Trends in Industry 4.0
- 10.6.1. Potential Risks Related to the Use of AI

10.7. Public Administration
- 10.7.1. Implications of AI and Data Analysis in Public Administration
- 10.7.2. Use in Public Administration
- 10.7.3. Potential Risks Related to the Use of AI

10.8. Education
- 10.8.1. Implications of AI and Data Analysis in Education
- 10.8.2. Potential Risks Related to the Use of AI

10.9. Forestry and Agriculture
- 10.9.1. Implications of AI and Data Analysis in Forestry and Agriculture
- 10.9.2. Use in Forestry and Agriculture
- 10.9.3. Potential Risks Related to the Use of AI

10.10. Human Resources
- 10.10.1. Implications of AI and Data Analysis in Human Resources
- 10.10.2. Practical Applications in the Business World
- 10.10.3. Potential Risks Related to the Use of AI

A program designed for computer engineers who want to change or boost their professional career"

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"

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 has been the most widely used learning system among the world's leading Information Technology 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 that you are presented with in the case method, an action-oriented learning method. Throughout the course, students 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

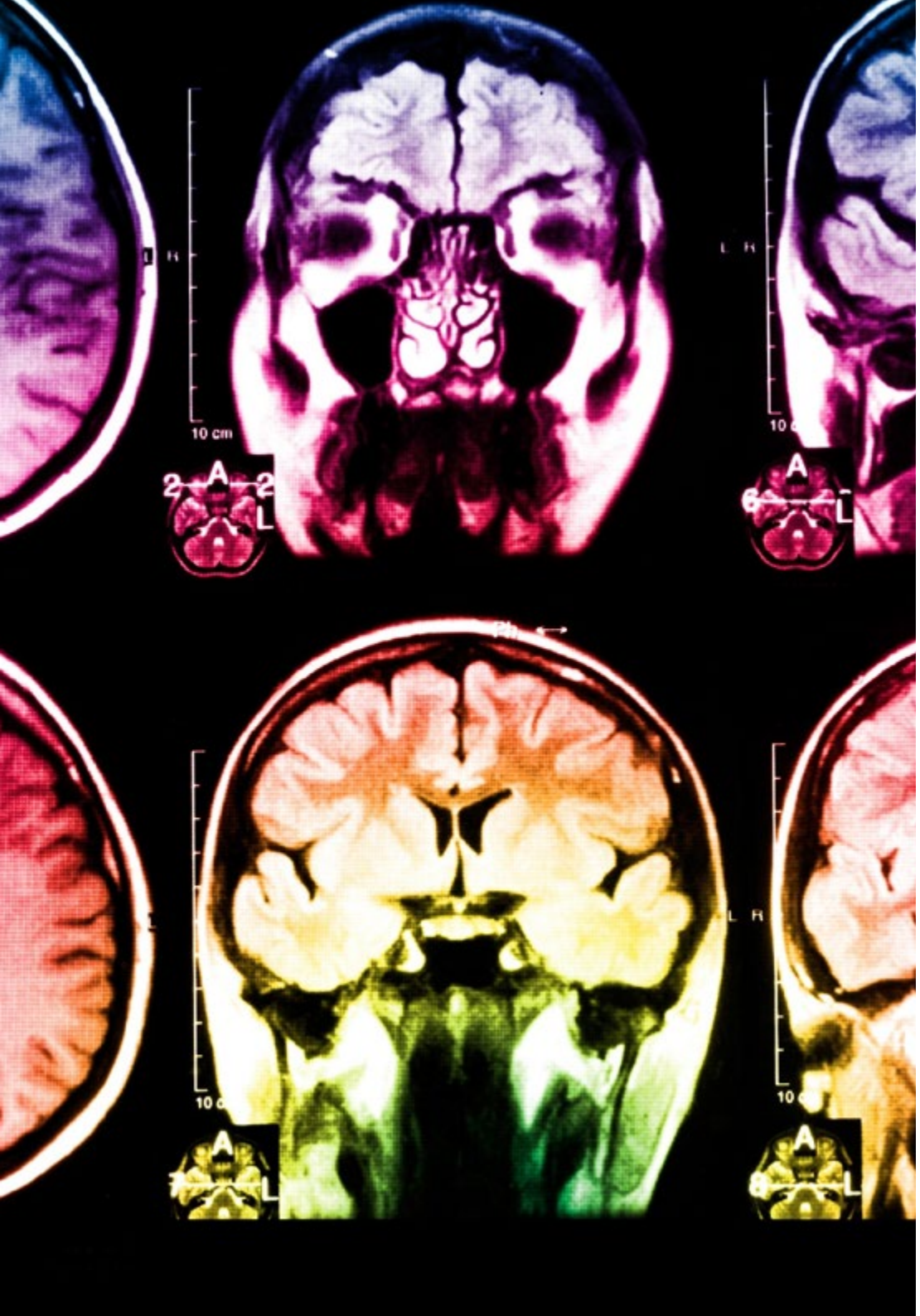
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.

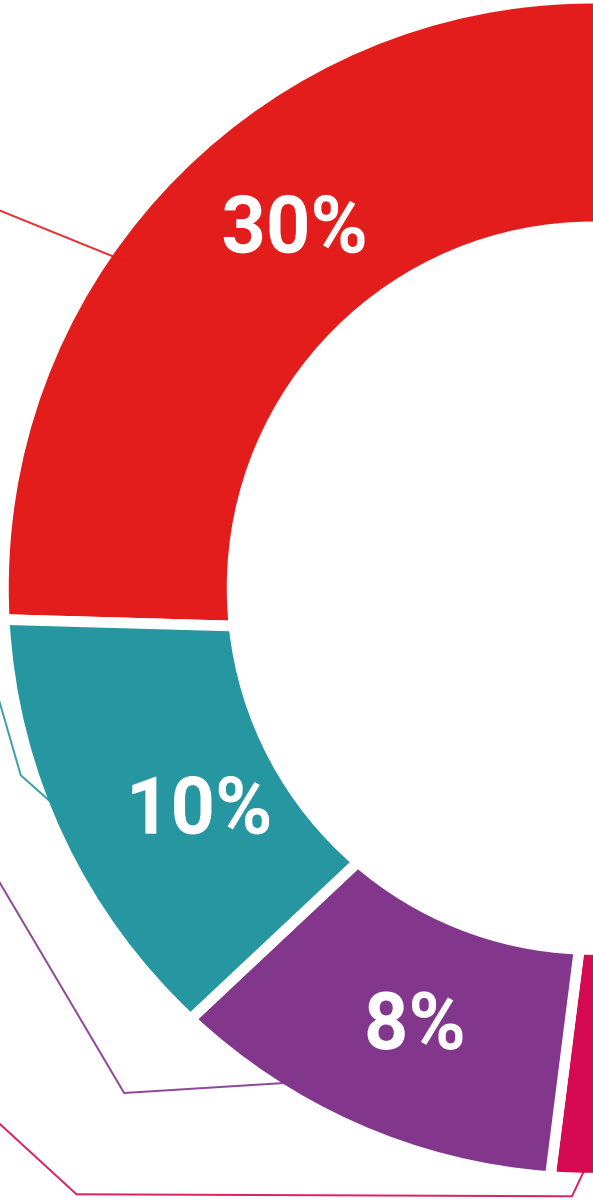
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

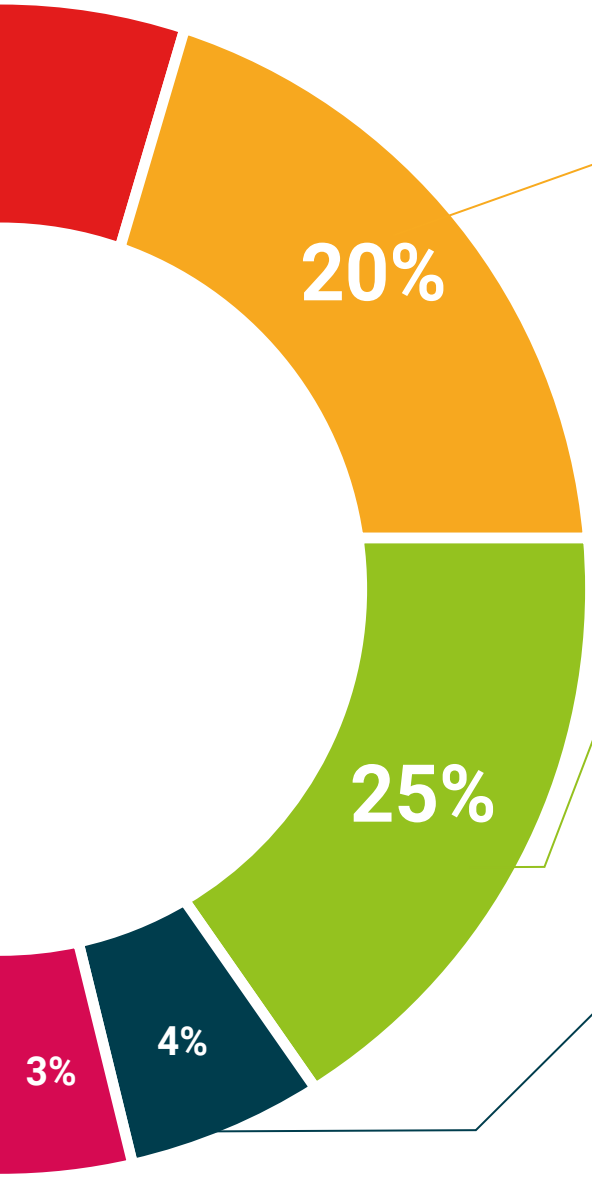
Practising Skills and Abilities

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.

07

Certificate

The Professional Master's Degree in Data Science Management (DSO, Data Science Officer) guarantees you, in addition to the most rigorous and up-to-date training, access to a Professional Master's Degree issued by TECH Technological University.

Successfully complete this program and receive your university degree without travel or laborious paperwork”

This **Professional Master's Degree in Data Science Management (DSO, Data Science Officer)** 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** 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 Data Science Management (DSO, Data Science Officer)**

Official Nº of hours: **1,500 h.**


tech technological university

Awards the following

CERTIFICATE

to

Mr./Ms. _____, with identification number _____.

For having successfully passed and accredited the following program

PROFESSIONAL MASTER'S DEGREE

in

Data Science Management (DSO, Data Science Officer)

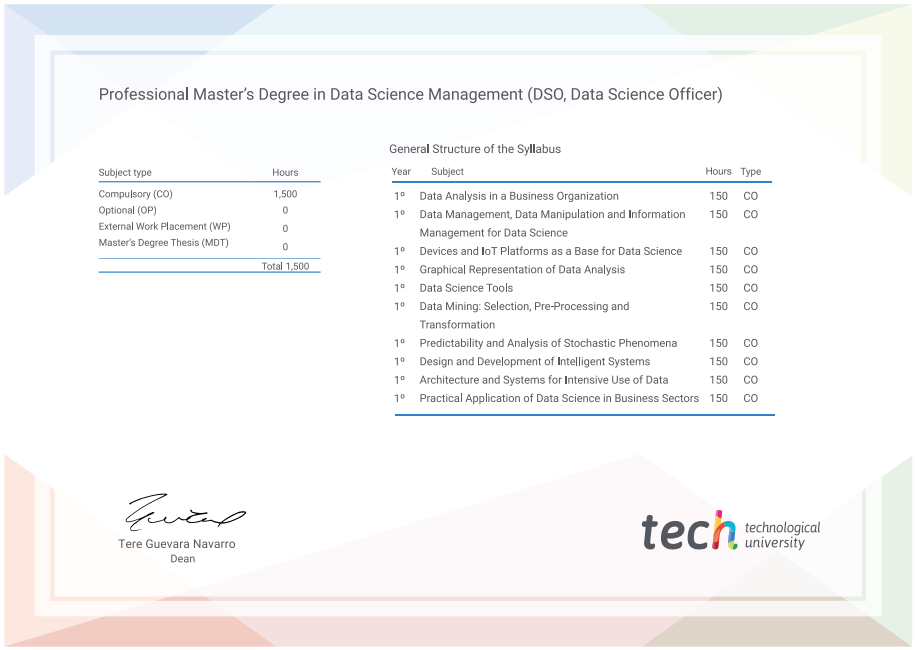
This is a qualification awarded by this University, equivalent to 1,500 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro
Dean

Unique TECH Code: AFWORD23S techtitute.com/certificates


Professional Master's Degree in Data Science Management (DSO, Data Science Officer)

Subject type	Hours
Compulsory (CO)	1,500
Optional (OP)	0
External Work Placement (WP)	0
Master's Degree Thesis (MDT)	0
	Total 1,500

General Structure of the Syllabus

Year	Subject	Hours	Type
1º	Data Analysis in a Business Organization	150	CO
1º	Data Management, Data Manipulation and Information Management for Data Science	150	CO
1º	Devices and IoT Platforms as a Base for Data Science	150	CO
1º	Graphical Representation of Data Analysis	150	CO
1º	Data Science Tools	150	CO
1º	Data Mining: Selection, Pre-Processing and Transformation	150	CO
1º	Predictability and Analysis of Stochastic Phenomena	150	CO
1º	Design and Development of Intelligent Systems	150	CO
1º	Architecture and Systems for Intensive Use of Data	150	CO
1º	Practical Application of Data Science in Business Sectors	150	CO

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*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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Professional Master's Degree

Data Science Management (DSO, Data Science Officer)

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

Professional Master's Degree

Data Science Management (DSO, Data Science Officer)