



## Computer Science, Artificial Intelligence and Data Systems

16 - 20 Nov 2026  
Barcelona (Spain)



# Computer Science, Artificial Intelligence and Data Systems

**Ref.:** 121684\_1042935 **Date:** 16 - 20 Nov 2026 **Location:** Barcelona (Spain) **Fees:** 6200 Euro

## Introduction

This Computer Science, Artificial Intelligence and Data Systems course provides a foundation in computer science principles combined with modern artificial intelligence and data systems. It explores how computational thinking supports the design and development of intelligent systems in real-world environments. Participants will gain a structured understanding of algorithms, data structures, and system architectures. The program introduces key concepts in artificial intelligence, including machine learning and data-driven decision-making. It emphasizes how data systems support scalable AI applications and digital transformation. Learners will understand how computer science, artificial intelligence, and data systems integrate to solve complex technological challenges.

## Targeted Groups

This Computer Science, Artificial Intelligence and Data Systems training targets professionals seeking knowledge and skills:

- IT professionals aiming to strengthen core computer science foundations.
- Data analysts transitioning into advanced data systems roles.
- Software developers expanding into AI and machine learning.
- Business analysts work with data-driven decision models.
- Graduates in computer science or related technical fields.
- Engineers involved in digital transformation projects.
- Managers overseeing AI and data infrastructure initiatives.
- Researchers exploring computational intelligence applications.

## Course Objectives

Participants will achieve the following objectives by completing the Computer Science, Artificial Intelligence and Data Systems course:

- Understand core computer science principles, including algorithms, data structures, and computational logic for modern system design.
- Develop the ability to analyze artificial intelligence concepts such as supervised and unsupervised learning models.
- Gain knowledge of data systems architecture, including databases, data pipelines, and distributed systems.
- Learn how machine learning models are trained, evaluated, and optimized for real-world applications.
- Explore cloud computing environments supporting scalable AI solutions and big data processing.
- Strengthen analytical thinking for solving complex computational problems using structured methodologies.
- Understand data science workflows from data collection to interpretation and visualization.
- Build conceptual awareness of the integration of AI models with enterprise data systems.
- Apply theoretical knowledge to evaluate emerging technologies in computer science and artificial intelligence domains.

## Targeted Competencies

Participants will gain the following competencies during the Computer Science, Artificial Intelligence and Data Systems program:

- Interpret and apply computer science concepts in data-driven environments.
- Understand artificial intelligence models and their functional mechanisms in problem-solving.
- Competence in evaluating data systems architecture and database design principles.
- Skills in analyzing machine learning workflows and predictive modeling techniques.
- Awareness of big data analytics and distributed computing environments.
- Capacity to assess algorithm efficiency and computational performance.
- Integrate AI systems with structured and unstructured data sources.
- Ability to critically evaluate data science methodologies and AI-driven decision frameworks.

## Studying Scenarios

In this Computer Science, Artificial Intelligence and Data Systems training, participants develop skills through the following scenarios:

- Case-based analysis of AI-driven recommendation systems in digital platforms.
- Examination of data system failures and optimization in enterprise environments.
- Conceptual modeling of machine learning applications in predictive analytics.
- Evaluation of cloud-based data processing systems for scalability challenges.
- Theoretical simulation of algorithm design for real-world computational problems.

## Course Content

### Unit 1: Foundations of Computer Science and Computational Thinking

- Introduction to computer science principles and modern digital ecosystems.
- Understanding computational thinking for structured problem-solving approaches.
- Study of algorithms as core building blocks in software and AI systems.
- Exploration of data structures, including arrays, lists, trees, and graphs.
- Analysis of problem decomposition and abstraction in system design.
- Overview of programming logic and theoretical execution models.
- Introduction to complexity theory and performance evaluation concepts.
- Relationship between computer science and the foundations of artificial intelligence.
- Application of computational models in real-world digital systems.

### Unit 2: Data Systems Architecture and Database Fundamentals

- Overview of data systems and their role in enterprise environments.
- Study of relational database management systems and SQL concepts.
- Introduction to NoSQL databases and unstructured data handling methods.
- Data modeling techniques, including conceptual, logical, and physical design.
- Exploration of data storage mechanisms and retrieval optimization.
- Understanding distributed data systems and scalability principles.
- Role of data pipelines in modern data engineering workflows.
- Data integrity, normalization, and consistency in database systems.
- Integration of databases with artificial intelligence applications.

### Unit 3: Artificial Intelligence Principles and Machine Learning

- Introduction to artificial intelligence concepts and intelligent systems.
- Overview of supervised learning, unsupervised learning, and reinforcement learning.
- Study of machine learning algorithms and predictive modeling techniques.
- Understanding training data, feature selection, and model optimization.
- Evaluation of AI models using accuracy, precision, and recall metrics.
- Exploration of neural networks and deep learning architectures.
- Role of pattern recognition in AI-driven decision systems.
- Ethical considerations in artificial intelligence development and deployment.
- Application of AI models in real-world business and industrial contexts.

## **Unit 4: Data Science, Big Data Analytics and Cloud Computing**

- Introduction to data science workflows and analytical methodologies.
- Exploration of big data concepts and large-scale data processing systems.
- Study of data visualization techniques for insights communication.
- Understanding data mining methods and pattern extraction processes.
- Role of cloud computing in scalable data storage and processing.
- Overview of distributed computing frameworks and architectures.
- Integration of AI models within big data environments.
- Data-driven decision-making in enterprise and research contexts.
- Security and governance in cloud-based data systems.

## **Unit 5: Integration of AI Systems and Emerging Technologies**

- Study of AI system integration with enterprise data architectures.
- Understanding intelligent automation and decision support systems.
- Exploration of edge computing and real-time data processing.
- Role of APIs in connecting AI models with data platforms.
- Overview of digital transformation driven by artificial intelligence.
- Analysis of emerging technologies in computer science innovation.
- Future trends in AI systems and autonomous computing models.
- Integration challenges between legacy systems and modern AI tools.
- Strategic impact of AI and data systems on organizational growth.

## **Final Insights & Key Takeaways**

This course builds a strong theoretical foundation in computer science, artificial intelligence, and data systems for modern digital environments. It enables learners to understand how intelligent technologies and data-driven architectures shape future innovation and decision-making.



Dubai - UAE: +971 4 450 5697  
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