MERCURY

Computer Science and AI Foundations for Digital Innovation

Dubai - UAE: +971 4 450 5697
Istanbul - Türkiye: +90 539 599 1206
Amman - Jordan: +962 79 712 3347

Computer Science and AI Foundations for Digital Innovation

Introduction

This Computer Science and AI Foundations for Digital Innovation course provides a theoretical foundation in computer science and artificial intelligence with a strong focus on digital innovation. It is designed to bridge the gap between core computing principles and modern AI-driven transformation across industries. Learners will understand essential concepts, including algorithms, data structures, and programming fundamentals, that shape digital systems. The program explores the basics of artificial intelligence and how machine learning supports intelligent decision-making. It highlights the role of data science in building smart solutions and optimizing digital processes. Participants will gain an understanding of how computer science and AI enable innovation in the digital economy.

Targeted Groups

This Computer Science and AI Foundations for Digital Innovation training targets professionals seeking knowledge and skills:

- IT beginners aiming to understand computer science fundamentals and AI basics.
- Business professionals exploring digital innovation and AI-driven transformation.
- Students in computing, engineering, or data science fields.
- Analysts seeking foundational knowledge in machine learning and data science.
- Managers involved in digital strategy and technology adoption.

Course Objectives

Participants will achieve the following objectives by completing the Computer Science and AI Foundations for Digital Innovation course:

- Understand core computer science principles, including algorithms, data structures, and computational thinking, to support structured problem-solving in digital systems.
- Gain foundational knowledge of artificial intelligence concepts, machine learning foundations, and neural network basics for intelligent system awareness.
- Explore programming fundamentals and software development logic used in modern computing environments and digital platforms.
- Analyze the role of data science for beginners in extracting insights and supporting evidence-based decision-making processes.
- Examine digital innovation strategy and how AI-driven transformation reshapes industries, services, and organizational performance.
- Develop theoretical awareness of system design, computational models, and technology ecosystems supporting scalable digital solutions.

Targeted Competencies

Participants will gain the following competencies during the Computer Science and AI Foundations for Digital Innovation program:

- Ability to interpret core computer science concepts and apply computational thinking in

Dubai - UAE: +971 4 450 5697
Istanbul - Türkiye: +90 539 599 1206
Amman - Jordan: +962 79 712 3347

structured problem-solving environments.
- Understanding of the basics of artificial intelligence, including supervised and unsupervised learning, as well as model training principles.
- Competence in identifying programming logic, algorithmic flow, and software architecture fundamentals in digital systems.
- Awareness of data science methodologies and their role in transforming raw data into actionable digital insights.
- Strategic understanding of digital innovation processes and AI integration in business and technology ecosystems.

Studying Scenarios

In this Computer Science and AI Foundations for Digital Innovation training, participants develop skills through the following scenarios:

- Analysis of how algorithms improve decision-making efficiency in digital systems and business applications.
- Evaluation of AI-powered tools in automating tasks and enhancing organizational productivity.
- Exploration of data-driven case studies demonstrating machine learning applications in real-world environments.

Course Content

Unit 1: Introduction to Computer Science Foundations

- Understanding computer science fundamentals and their role in modern digital ecosystems.
- Overview of computational thinking as a structured problem-solving approach.
- Introduction to programming fundamentals and logic building for digital systems.
- Exploration of algorithms and their importance in processing information efficiently.
- Study of data structures and their use in organizing and managing digital data.
- Introduction to system architecture and how computing components interact.
- Understanding the software development lifecycle in theoretical computing models.
- Overview of operating systems and their role in managing computing resources.
- Introduction to networks and their role in enabling digital communication systems.

Unit 2: Programming Fundamentals and Computational Logic

- Understanding programming paradigms and their classification in software development.
- Introduction to syntax, semantics, and structure of programming languages.
- Exploration of variables, data types, and control structures in computational logic.
- Study of functions, procedures, and modular programming principles.
- Understanding debugging concepts and logical error identification methods.
- Introduction to object-oriented programming principles and abstraction concepts.
- Overview of algorithmic design and step-by-step solution structuring.
- Exploration of problem-solving techniques using computational models.
- Understanding code efficiency and optimization principles in software logic.

Unit 3: Artificial Intelligence and Machine Learning Basics

- Introduction to artificial intelligence concepts and intelligent system design.
- Overview of machine learning foundations and learning models.

Dubai - UAE: +971 4 450 5697
Istanbul - Türkiye: +90 539 599 1206
Amman - Jordan: +962 79 712 3347

- Understanding supervised learning and labeled data processing.
- Exploration of unsupervised learning and pattern discovery methods.
- Introduction to reinforcement learning and decision-making systems.
- Study of neural networks and basic deep learning principles.
- Understanding AI model training, validation, and evaluation concepts.
- Overview of intelligent automation and AI-driven systems in industries.
- Exploration of ethical considerations in artificial intelligence applications.

Unit 4: Data Science and Digital Intelligence

- Introduction to data science fundamentals and analytical thinking models.
- Understanding data collection, cleaning, and preprocessing concepts.
- Exploration of data visualization techniques for pattern recognition.
- Study of statistical methods used in digital analysis and interpretation.
- Understanding big data concepts and large-scale information processing.
- Introduction to predictive analytics and forecasting models.
- Overview of data-driven decision-making in digital environments.
- Exploration of business intelligence systems and reporting frameworks.
- Understanding the role of data in AI model development and optimization.

Unit 5: Digital Innovation and AI Transformation

- Understanding digital innovation strategy and transformation frameworks.
- Exploration of AI-driven transformation in modern industries.
- Study of emerging technologies shaping the digital economy landscape.
- Introduction to smart systems and intelligent automation in organizations.
- Understanding cloud computing and its role in scalable digital solutions.
- Exploration of cybersecurity fundamentals in digital environments.
- Study of the innovation lifecycle from ideation to implementation.
- Understanding digital ecosystems and interconnected technology platforms.
- Overview of future trends in artificial intelligence and computing evolution.

Final Insights & Key Takeaways

This course builds a strong theoretical foundation in computer science fundamentals, artificial intelligence basics, and data science principles essential for modern digital transformation. It equips learners with structured knowledge to understand how digital innovation and AI technologies shape future industries and intelligent systems.