Cognitive Computing and Intelligent System Design Training Course

02 - 06 Nov 2026

Lisbon

4500 € (Per Person)

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Course Introduction / Overview:

This course provides a comprehensive exploration of cognitive computing and the principles behind designing intelligent systems. It moves beyond traditional programming to delve into creating systems that can learn, reason, and interact with humans naturally. We will explore how to build applications that simulate human thought processes to solve complex problems in ambiguous and uncertain environments. Drawing upon foundational concepts discussed by pioneers like Herbert A. Simon, this program bridges the gap between theoretical artificial intelligence and practical application. Participants will gain insights from seminal works such as "Artificial Intelligence: A Modern Approach" by Stuart Russell and Peter Norvig, understanding the core technologies like machine learning, natural language processing, and neural networks. At BIG BEN Training Center, our curriculum is designed to equip professionals with the skills to architect and implement sophisticated cognitive solutions. This training course focuses on the entire lifecycle of intelligent system design, from conceptualization and cognitive modeling to ethical considerations and deployment, ensuring participants can lead innovative AI projects and drive digital transformation within their organizations.

Target Audience / This training course is suitable for:

- AI Engineers and Developers.
- Data Scientists and Analysts.
- Software Architects and System Designers.
- IT Project Managers and Team Leaders.
- Product Managers responsible for AI-driven products.
- Business Analysts seeking to leverage cognitive technologies.
- Technology Consultants and Strategists.
- Research and Development Professionals.

Target Sectors and Industries:

- Information Technology and Software Development.
- Healthcare and Life Sciences.
- Banking, Finance, and Insurance.
- Retail and E-commerce.
- Telecommunications.
- Manufacturing and Industrial Automation.
- Government and Public Sector Agencies.
- Consulting and Professional Services.

Target Organizations Departments:

- Research and Development (R&D).
- Information Technology (IT) and Engineering.
- Data Analytics and Business Intelligence.
- Product Management and Development.
- Innovation and Strategy Departments.
- Operations and Process Automation.
- Digital Transformation Teams.
- Customer Experience and Service Departments.

Course Offerings:

By the end of this course, the participants will have able to:

- Understand the fundamental principles of cognitive computing and its distinction from traditional AI.
- Analyze and apply various machine learning algorithms for building intelligent models.
- Utilize natural language processing (NLP) techniques for text and speech analysis.
- Design robust cognitive architectures and knowledge representation frameworks.
- Develop and evaluate intelligent systems for specific business applications.
- Integrate ethical considerations and principles of explainable AI (XAI) into system design.
- Manage the lifecycle of an AI project from conception to deployment.
- Assess the future trends and potential impact of cognitive technologies on industries.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be highly interactive, practical, and engaging, ensuring a deep and lasting understanding of cognitive computing and intelligent system design. We believe in learning by doing, so the course heavily emphasizes hands-on labs, real-world case studies, and a capstone project where participants design a conceptual intelligent system. The program blends expert-led instruction with collaborative group discussions, allowing participants to share insights and solve complex problems together. Interactive sessions, practical exercises, and simulations will be used to reinforce theoretical concepts and demonstrate their application in business contexts. Our expert instructors facilitate a dynamic learning environment, providing continuous feedback and personalized guidance. This experiential learning approach ensures that participants not only grasp the technical aspects of AI system design but also develop the critical thinking and strategic planning skills necessary to implement effective cognitive solutions in their own organizations.

Course Agenda (Course Units):

Unit One: Foundations of Cognitive Computing

- Introduction to Cognitive Computing and Artificial Intelligence.
- History and Evolution of Intelligent Systems.
- Differentiating Cognitive Systems from Traditional Analytics.
- Core Components: Machine Learning, NLP, and Self-Learning.
- Cognitive Architecture and Human Brain Analogies.
- Key Industry Applications and Use Cases.
- Ethical Foundations and Responsible AI.

Unit Two: Machine Learning for Intelligent Systems

- Supervised, Unsupervised, and Reinforcement Learning Models.
- Deep Learning and Neural Network Fundamentals.
- Building and Training Predictive Models.
- Algorithm Selection and Performance Evaluation.
- Feature Engineering and Data Pre-processing Techniques.
- Introduction to Popular ML Frameworks and Libraries.
- Practical Lab: Developing a Simple Classification Model.

Unit Three: Natural Language Processing (NLP) and Human-Computer Interaction

- Fundamentals of Natural Language Processing.
- Techniques for Text Mining and Sentiment Analysis.
- Developing Chatbots and Virtual Assistants.
- Speech Recognition and Synthesis Technologies.
- Principles of Human-Computer Interaction (HCI) in AI.
- Designing Intuitive and Intelligent User Interfaces.
- Case Study: Analyzing Customer Feedback with NLP.

Unit Four: Architecting and Designing Intelligent Systems

- The Intelligent System Design Lifecycle.
- Knowledge Representation and Reasoning Systems.
- Cognitive Modeling and Simulation Techniques.
- Designing Scalable and Resilient AI Architectures.
- Data Governance and Management for AI Systems.
- Principles of Explainable AI (XAI) and Model Interpretability.
- Workshop: Blueprinting a Cognitive System for a Business Problem.

Unit Five: Deployment, Management, and Future of Cognitive AI

- Strategies for Deploying AI Models into Production.
- Monitoring, Maintaining, and Retraining Intelligent Systems.
- AI Project Management Methodologies.
- The Business Impact and ROI of Cognitive Solutions.
- Emerging Trends: Quantum Computing and Neuromorphic Chips.
- The Future of Human-AI Collaboration.
- Final Project Presentations and Course Wrap-up.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

As cognitive systems become more autonomous, where should the line be drawn between human oversight and machine-led decision-making in critical sectors like healthcare and finance?

What unique qualities does this course offer compared to other courses?

This training course distinguishes itself by offering a holistic and strategic perspective on intelligent system design, moving beyond purely technical implementation. While many courses focus on specific algorithms or programming languages, our curriculum emphasizes the entire design lifecycle, from conceptual cognitive modeling to the ethical and business implications of deployment. We place a strong emphasis on architecting systems that are not only intelligent but also explainable, ethical, and aligned with organizational goals. The program uniquely integrates principles of Human-Computer Interaction (HCI) and Explainable AI (XAI) as core components, ensuring participants learn to build systems that are trusted and easily adopted by users. Rather than just presenting tools, we cultivate a deep understanding of cognitive principles, enabling participants to select and design the right solutions for complex, unstructured problems. The course's focus on real-world case studies and a capstone design project provides a practical, hands-on experience that is directly transferable to the workplace, empowering attendees to lead, innovate, and build the next generation of intelligent applications.