ISTQB® Certified Tester AI Testing (CT-AI) incl Exam

Duration: 3 Days **Course Code: ISTQB-CT-AI** **Delivery Method: Company Event**

Overview:

The ISTQB® Certified Tester – AI Testing (CT-AI) training provides deep insight into both testing AI-based systems and applying AI for test support. You will learn the quality requirements, risks, methods and techniques unique to AI, and how to assess AI systems effectively, transparently and reliably.

Company Events

These events can be delivered exclusively for your company at our locations or yours, specifically for your delegates and your needs. The Company Events can be tailored or standard course deliveries.

Target Audience:

This course is designed for testers, test analysts, test engineers, test consultants, developers and QA professionals who:
Are involved in testing AI systems or AI in test processes
Want to understand what AI technology means for test quality and risk management
Are responsible for AI testing strategies and governance within their organization

Objectives:

- **After completing this course you should be able to:**
- Understand the current state and expected trends of AI
- Experience the implementation and testing of a ML model and recognize where testers can best influence its quality
- Understand the challenges associated with testing AI-Based systems, such as their self-learning capabilities, bias, ethics, complexity, non-determinism, transparency and explainability
- Contribute to the test strategy for an AI-Based system
- Design and execute test cases for AI-based systems
- Recognize the special requirements for the test infrastructure to support the testing of AI-based systems
- Understand how AI can be used to support software testing

Prerequisites:

Attendees should meet the following prerequisites:

- Completed the ISTQB Certified Tester Foundation Level (CTFL)
- Have a basic understanding of software testing principles before advancing to AI-specific testing concepts.
- ISTQB-CTFL - ISTQB Certified Tester Foundation Level (CTFL) + exam

Testing and Certification

Recommended as preparation for the following exams:

- ISTQB® Certified Tester AI Testing (CT-AI) certification

Content:

Module1: Introduction to AI

- Definition of AI and AI Effect
- Narrow, General and Super AI
- AI-Based and Conventional Systems
- AI Technologies
- AI Development Frameworks
- Hardware for AI-Based Systems
- AI as a Service (AIaaS)
- Contracts for AI as a Service
- AIaaS Examples
- Pre-Trained Models
- Introduction to Pre-Trained Models
- Transfer Learning
- Risks of using Pre-Trained Models and Transfer Learning
- Standards, Regulations and AI

Module 2: Quality Characteristics for AI-Based Systems

- Flexibility and Adaptability
- Autonomy
- Evolution
- Bias
- Ethics
- Side Effects and Reward Hacking
- Transparency, Interpretability and Explainability
- Safety and AI

Module 3: Machine Learning (ML) – Overview

- Forms of ML
- Supervised Learning
- Unsupervised Learning
- Reinforcement Learning
- ML Workflow
- Selecting a Form of ML
- Factors Involved in ML Algorithm Selection
- Overfitting and Underfitting
- Overfitting
- Underfitting
- Hands-On Exercise: Demonstrate Overfitting and Underfitting

Module 4: ML - Data

- Data Preparation as Part of the ML Workflow
- Challenges in Data Preparation
- Hands-On Exercise: Data Preparation for ML, Validation and Test Datasets in the ML Workflow
- Hands-On Exercise: Identify Training and Test Data and Create an ML Model
- Dataset Quality Issues
- Data Quality and its Effect on the ML Model
- Data Labelling for Supervised Learning
- Approaches to Data Labelling
- Mislabeled Data in Datasets

Module 5: ML Functional Performance Metrics

- Confusion Matrix
- Additional ML Functional Performance Metrics for Classification, Regression and Clustering
- Limitations of ML Functional Performance Metrics
- Selecting ML Functional Performance Metrics
- Hands-On Exercise: Evaluate the Created ML Model
- Benchmark Suites for ML

Module 6: ML - Neural Networks and Testing

- Neural Networks
- Hands-On Exercise: Implement a Simple Perceptron
- Coverage Measures for Neural Networks

Module 7: Testing AI-Based Systems Overview

- Specification of AI-Based Systems
- Test Levels for AI-Based Systems
- Input Data Testing
- ML Model Testing
- Component Testing
- Component Integration Testing
- System Testing
- Acceptance Testing
- Test Data for Testing AI-based Systems
- Testing for Automation Bias in AI-Based Systems
- Documenting an AI Component
- Testing for Concept Drift
- Selecting a Test Approach for an ML System

Module 8: Testing AI-Specific Quality Characteristics

- Challenges Testing Self-Learning Systems
- Testing Autonomous AI-Based Systems
- Testing for Algorithmic, Sample and Inappropriate Bias
- Challenges Testing Probabilistic and Non-Deterministic AI-Based Systems
- Challenges Testing Complex AI-Based Systems
- Testing the Transparency, Interpretability and Explainability of AI-Based Systems
- Hands-On Exercise: Model Explainability
- Test Oracles for AI-Based Systems
- Test Objectives and Acceptance Criteria

Module 9: Methods and Techniques for the Testing of AI-Based Systems

- Adversarial Attacks and Data Poisoning
- Adversarial Attacks
- Data Poisoning
- Pairwise Testing
- Hands-On Exercise: Pairwise Testing
- Back-to-Back Testing
- A/B Testing
- Metamorphic Testing (MT)
- Hands-On Exercise: Metamorphic Testing
- Experience-Based Testing of AI-Based Systems
- Hands-On Exercise: Exploratory Testing and Exploratory Data Analysis (EDA)
- Selecting Test Techniques for AI-Based Systems

Module 10: Test Environments for AI-Based Systems

- Test Environments for AI-Based Systems
- Virtual Test Environments for Testing AI-Based Systems

Module 11: Using AI for Testing

- AI Technologies for Testing
- Hands-On Exercise:The Use of AI in Testing
- Using AI to Analyze Reported Defects
- Using AI for Test Case Generation
- Using AI for the Optimization of Regression Test Suites
- Using AI for Defect Prediction
- Hands-On Exercise: Build a Defect Prediction System
- Using AI for Testing User Interfaces
- Using AI to Test Through the Graphical User Interface (GUI)
- Using AI to Test the GUI.

Further Information:

For More information, or to book your course, please call us on Head Office 01189 123456 / Northern Office 0113 242 5931

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