Certified Tester AI Testing (CT-AI) Training

Duration: **3 Day**

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Certified Tester AI Testing (CT-AI) is a comprehensive four-day course designed to provide participants with a solid understanding of Artificial Intelligence (AI) technologies and the methods used to evaluate and test AI-enabled software systems.

The first part of the programme introduces the core concepts of Artificial Intelligence, covering different AI categories, enabling technologies, and development frameworks. Participants will also examine the quality characteristics unique to AI-based systems, including adaptability, autonomy, ethics, transparency, and trustworthiness. The Machine Learning (ML) section explores algorithm selection, data preparation, model development, performance evaluation, and the fundamentals of neural networks.

Building on these foundations, the course focuses on the challenges of testing AI-based systems. Learners will investigate AI-specific testing concerns such as bias, non-deterministic behaviour, concept drift, and explainability while gaining practical knowledge of modern testing approaches including adversarial testing, metamorphic testing, and A/B testing.

The final part of the course demonstrates how Artificial Intelligence can improve software testing activities. Participants will explore AI-assisted defect analysis, automated test case generation, regression test optimization, and intelligent testing techniques, enabling them to apply AI effectively within modern software quality assurance environments.

Prerequisites

To attend this course and sit the**Certified Tester AI Testing (CT-AI)** examination, participants must hold the following certification:

- **ISTQB® Certified Tester Foundation Level (CTFL)**

Who Should Attend

This course is intended for:

- Software testers and Quality Assurance (QA) professionals.
- Test analysts working with AI-enabled systems.
- Test consultants and test managers.
- Software developers involved in AI-based applications.
- Professionals responsible for quality assurance of Artificial Intelligence solutions.
- Test professionals working within Agile or traditional software development lifecycles.
- Anyone interested in developing expertise in testing AI-based systems.

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What You Will Learn

Upon successful completion of this course, participants will be able to:

- Explain the fundamental concepts, technologies, and development approaches of Artificial Intelligence.
- Evaluate the quality characteristics unique to AI-based systems, including adaptability, autonomy, ethics, and transparency.
- Describe Machine Learning workflows, algorithm selection criteria, and model development processes.
- Assess the importance of data preparation and data quality in Machine Learning performance.
- Interpret performance metrics used for classification, regression, and clustering models.
- Explain the principles of neural networks and the techniques used to test them.
- Apply testing strategies designed specifically for AI-based systems while addressing bias, non-deterministic behaviour, concept drift, and explainability.
- Apply AI-specific testing techniques including Adversarial Testing, Metamorphic Testing, and A/B Testing.
- Use Artificial Intelligence to improve software testing activities such as defect analysis, automated test generation, and regression test optimization.

Training Outline

Chapter 1 - Introduction to Artificial Intelligence

- Definition of Artificial Intelligence and the AI Effect
- Narrow AI, General AI, and Super AI
- Differences between AI-based systems and conventional software systems
- Core Artificial Intelligence technologies
- AI development frameworks and platforms
- Hardware supporting AI solutions
- Artificial Intelligence as a Service (AIaaS)
- Pre-trained AI models
- AI standards, regulations, and governance

Chapter 2 - Quality Characteristics of AI-Based Systems

- Flexibility and adaptability
- Autonomous behaviour
- Continuous evolution
- Algorithmic and data bias
- Ethical considerations
- Side effects and reward hacking
- Transparency, interpretability, and explainability
- Safety in AI systems

Chapter 3 - Machine Learning Overview

- Forms of Machine Learning
- Machine Learning workflow
- Selecting the appropriate ML approach

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- Factors influencing algorithm selection
- Overfitting and underfitting

Chapter 4 - Data in Machine Learning

- Data preparation processes
- Training, validation, and test datasets
- Dataset quality challenges
- The impact of data quality on model performance
- Data labelling for supervised learning

Chapter 5 - Machine Learning Performance Metrics

- Understanding the Confusion Matrix
- Performance metrics for classification, regression, and clustering
- Limitations of Machine Learning metrics
- Selecting appropriate evaluation metrics
- Benchmark datasets and performance comparisons

Chapter 6 - Neural Networks and Testing

- Fundamentals of neural networks
- Coverage measurements for neural networks
- Testing approaches for neural network models

Chapter 7 - Testing AI-Based Systems

- Defining specifications for AI-based systems
- Test levels for Artificial Intelligence systems
- Preparing test data
- Evaluating automation bias
- Documenting AI components
- Detecting and testing concept drift
- Selecting appropriate testing strategies for Machine Learning systems

Chapter 8 - Testing AI-Specific Quality Characteristics

- Challenges of testing self-learning systems
- Testing autonomous AI solutions
- Detecting algorithmic, sample, and inappropriate bias
- Testing probabilistic and non-deterministic systems
- Challenges associated with complex AI systems
- Verifying transparency, interpretability, and explainability
- Test oracles for AI-based systems
- Defining test objectives and acceptance criteria

Chapter 9 - Testing Methods and Techniques for AI Systems

- Adversarial Testing and Data Poisoning
- Pairwise Testing
- Back-to-Back Testing
- A/B Testing
- Metamorphic Testing (MT)

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- Experience-based testing
- Selecting appropriate testing techniques for AI systems

Chapter 10 - Test Environments for AI Systems

- Designing test environments for AI-based systems
- Using virtual environments for AI testing

Chapter 11 - Using Artificial Intelligence in Software Testing

- AI technologies supporting software testing
- AI-assisted defect analysis
- Automated test case generation
- Regression test optimization
- Defect prediction
- AI-assisted user interface testing

Exams and Assessments

The course fee includes an **iSQI examination voucher**, allowing candidates to schedule their examination at a later date.

- Multiple-choice examination
- Examination duration: **60 minutes**
- Candidates taking the exam in a non-native language receive an additional**25% extra time** (75 minutes total).
- **40 examination questions**
- Total examination score: **47 points**
- A minimum of **31 points (65%)** is required to achieve a passing score.