



Artificial Intelligence & GenAI — Complete Course Content

WC Skills • World Class Skills Institute

Duration	14 Weeks
Target Audience	Developers, analysts and professionals entering AI
Prerequisites	Python basics recommended.

What this document contains

A module-wise training roadmap covering concepts, hands-on labs, project work, assessment checkpoints and interview preparation. The syllabus is designed as a structured course plan for classroom or live-online delivery.

Course Objectives & Learning Outcomes

By the end of this course, learners should be able to explain the core concepts, perform the practical tasks listed in the labs, troubleshoot common scenarios, document their work and complete the capstone with a professional implementation approach.

- Understand the architecture, terminology and end-to-end workflow of the subject.
- Perform guided hands-on exercises using the relevant tools and development/administration environment.
- Apply troubleshooting, testing, documentation and best-practice techniques.
- Build a portfolio-ready capstone demonstrating practical competency.
- Prepare for technical interviews with scenario-based questions and implementation discussions.

Detailed Module-wise Curriculum

Module 1: AI Foundations

- AI history and applications
- Machine learning vs deep learning
- Neural network intuition
- Data and compute
- Responsible AI

Hands-on Lab: Lab: classify AI use cases by technique.

Module 2: Python & Data for AI

- NumPy/Pandas
- Data preprocessing
- Visualization
- Datasets
- Experiment notebooks

Hands-on Lab: Lab: prepare a dataset for modeling.

Module 3: Deep Learning

- Neurons and layers
- Activation functions
- Loss and optimization
- Training loops
- Overfitting

Hands-on Lab: Lab: train a simple neural network.

Module 4: Computer Vision

- Image representation
- CNN concepts
- Transfer learning
- Detection awareness
- Evaluation

Hands-on Lab: Lab: build an image classifier.

Module 5: NLP

- Tokenization
- Embeddings
- Sequence models
- Transformers overview
- Text classification

Hands-on Lab: Lab: classify text with a pretrained model.

Module 6: Generative AI

- LLMs
- Tokens and context
- Prompting
- Generation parameters
- Evaluation

Hands-on Lab: Lab: create a prompt evaluation matrix.

Module 7: RAG & Enterprise AI

- Embeddings
- Vector search
- Retrieval
- Grounding
- Citations and evaluation

Hands-on Lab: Lab: design a document Q&A; system.

Module 8: Agents & Automation

- Tool use
- Agent loops
- Workflows
- Guardrails
- Human approval

Hands-on Lab: Lab: design an AI-assisted workflow.

Module 9: Deployment & Governance

- APIs
- Cloud inference
- Latency/cost
- Privacy
- Responsible AI

Hands-on Lab: Lab: prepare a production readiness checklist.

Module 10: Capstone

- Problem definition
- Prototype
- Evaluation
- Deployment architecture
- Presentation

Hands-on Lab: Lab: deliver an end-to-end AI/GenAI solution.

Practical Delivery Plan

Phase	Focus	Expected Evidence
1	Concept + demonstration	Notes, diagrams and guided exercises
2	Hands-on practice	Working configuration/code and screenshots/logs
3	Troubleshooting	Issue reproduction, diagnosis and resolution notes
4	Mini project	Functional solution with test cases
5	Capstone	End-to-end project, documentation and presentation

Assessment & Certification Readiness

Recommended assessment pattern: module quizzes (20%), practical labs (30%), mini project (20%), capstone (20%) and interview/viva (10%). Completion certificates, placement support and any certification claims should follow the institute's current published policy and the relevant vendor's certification rules.

Capstone Requirements

- Problem statement and scope
- Architecture/process diagram
- Implementation or configuration
- Test cases and results
- Troubleshooting notes
- User/technical documentation
- Final presentation and interview questions

Interview Preparation Topics

Learners should be able to answer architecture questions, explain the difference between key concepts, troubleshoot a real scenario, justify design choices, discuss performance/security considerations and walk through the capstone from requirement to deployment/support.

Recommended Learning Resources

Use official product documentation and current vendor guidance for version-specific commands, configuration steps and certification requirements. Validate training examples in a non-production environment before applying them to customer systems.