ARTIFICIAL INTELLIGENCE

UNIT CODE: ICT/CU/CS/CR/08/6/B

Relationship to Occupational Standards

This unit addresses the unit of competency: Understand Artificial Intelligence

Duration of Unit: 180 hours

Unit Description

This unit covers the competencies required to understand artificial intelligence. It involves understanding fundamentals of Artificial Intelligence, understanding problem solving techniques, understanding Python programming environment and developing Artificial Intelligence programs using Python.

Summary of Learning Outcomes

1. Understand Artificial Intelligence fundamentals.
2. Understand problem solving techniques.
3. Understand Python programming environment.
4. Develop Artificial Intelligence programs using Python.

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Understand concepts of Artificial Intelligence	• Definition of Artificial Intelligence • History of Artificial Intelligence • Foundations of Artificial Intelligence • Mathematics • Economics • Decision Theory • Neurology • Engineering • Psychology • Computer Networking • Applications of Artificial Intelligence • Expert systems • Machine Learning • Natural Language Processing	• Oral tests • Written tests • Practical tests

	• Gaming • Artificial Neural Networks • Computer Vison • Intelligence agents • Recognising Artificial Intelligence applications in real life	
2. Understand problem solving techniques	• Logical operators • AND • OR • NOT • Prepositional Logic and Predicate logic • Types of inferencing • Single Inferencing • Multiple inferencing • Case based reasoning • Definition of Machine Learning • Types of Machine Learning • Supervised Machine Learning • Unsupervised Machine Learning • Recognising applications of different types of inferencing	• Oral tests • Written tests • Practical tests
3. Understand Python programming environment	• Installation of Python • Downloading Python Set Up • Running Python Set Up • Python syntax • The Zen of Python • Python Enhancement Proposals 8 (PEP 8) • Variable declaration. • Commenting • Python data types • Integer • Float • Boolean	• Oral tests • Written tests • Practical tests

	• Set • Dictionary • Tuple • List • String • Control structures in Python • Selection • Looping • Functions in Python • Built-in functions • User defined functions • Lambda functions • Object Oriented Python • Creation of classes • Class variables • Class methods • Scientific Modules in Python • Pandas • Numpy • Matplotlib • Creation of programs using Scientific Modules	
4. Develop Artificial Intelligence programs using python	• Sci-Kit Learn • Machine Learning with K-Nearest Neighbours • Mathematics behind K-Nearest Neighbours • Making Predictions with K-Nearest Neighbours • Machine Learning with Naïve Bayes Algorithm • Mathematics behind Naïve Bayes Algorithm • Making predictions with Naïve Bayes Algorithm • Creation of AI programs using Machine learning	• Oral tests • Written tests • Practical tests

Suggested Methods of Instruction

- Presentations and practical demonstrations by trainer;
- Guided learner activities and research to develop underpinning knowledge;
- Supervised practical assignments and projects
- Visiting lecturer/trainer from the Computer Science sector;
- Industrial visits.

Recommended Resources

Tools

- Python IDE

Equipment

- Computer

Materials and supplies

- Video tutorials
- Instructional materials
- Stationery

Reference materials

- Python Programming text books
- Official Python website