

## UNDERSTAND ARTIFICIAL INTELLIGENCE CONCEPTS

UNIT CODE: ICT/OS/CS/CR/08/6/A

### 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.

<b>ELEMENT</b> These describe the <b>key outcomes</b> which make up <b>workplace function</b> .	<b>PERFORMANCE CRITERIA</b> These are <b>assessable</b> statements which specify the required level of performance for each of the elements. <i>(Bold and italicized terms are elaborated in the range.)</i>
1. Understand fundamentals of Artificial Intelligence	1.1 Artificial Intelligence is defined 1.2 The history of Artificial Intelligence is explained 1.3 Foundations of Artificial Intelligence are explained 1.4 Applications of Artificial Intelligence are explained 1.5 Intelligence agents are explained 1.6 Artificial Intelligence applications in real life are recognized
2. Understand problem solving techniques	2.1 Logical operators are outlined. 2.2 Propositional and Predicate logic are explained. 2.3 <b>Types of inferencing</b> are explained. 2.4 Machine Learning is defined. 2.5 <b>Types of Machine Learning</b> are explained. 2.6 Applications of different types of inferencing are recognized
3. Understand Python programming environment	3.1 Installation of Python is demonstrated. 3.2 Python syntax is demonstrated. 3.3 <b>Data types</b> in Python are demonstrated. 3.4 Control structures in Python are demonstrated. 3.5 Functions in python are demonstrated 3.6 Object Oriented Python is demonstrated. 3.7 <b>Scientific Modules</b> in Python are demonstrated.
4. Develop Artificial Intelligence programs using python	4.1 Sci-Kit Learn is explained. 4.2 Machine Learning with K-Nearest Neighbours is demonstrated. 4.3 Machine Learning with Naïve Bayes Algorithm is demonstrated.

## RANGE

This section provides work conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Types of inferencing may include but not limited to:	<ul style="list-style-type: none"><li>• Single</li><li>• Multiple</li><li>• Case based</li></ul>
2. Types of Machine Learning may include but not limited to:	<ul style="list-style-type: none"><li>• Supervised</li><li>• Unsupervised</li></ul>
3. Data types may include but not limited to:	<ul style="list-style-type: none"><li>• Integers</li><li>• Floats</li><li>• Strings</li><li>• Lists</li><li>• Tuple</li><li>• Sets</li><li>• Dictionaries</li></ul>
4. Scientific Modules may include but not limited to:	<ul style="list-style-type: none"><li>• Numpy</li><li>• Pandas</li><li>• Matplotlib</li></ul>

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required skills

The individual needs to demonstrate the following skills:

- Communications (verbal and written);
- Time management;
- Problem solving;
- Planning;
- Decision Making;
- Research;

### Required knowledge

The individual needs to demonstrate knowledge of:

- Concepts of Artificial Intelligence

- Problem solving techniques
- Python programming environment
- Development of Artificial Intelligence programs using python

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and understanding and range.

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Explained applications of artificial intelligence</li> <li>1.2 Explained the role of intelligence agents</li> <li>1.3 Explained types of inferencing</li> <li>1.4 Explained types of machine learning</li> <li>1.5 Demonstrated installation of Python</li> <li>1.6 Demonstrated Python syntax</li> <li>1.7 Demonstrate data types in Python</li> <li>1.8 Demonstrated use of control structures in Python</li> <li>1.9 Demonstrated use of functions in Python</li> <li>1.10 Demonstrated use of Object Oriented Python</li> <li>1.11 Demonstrated use of scientific modules</li> <li>1.12 Demonstrated machine learning</li> </ul>
2. Resource Implications	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>2.1 Access to relevant workplace where assessment can take place</li> <li>2.2 Appropriately simulated environment where assessment can take place</li> </ul>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Oral questioning</li> <li>3.2 Practical tests</li> <li>3.3 Observation</li> <li>3.4 Written tests</li> </ul>
4. Context of Assessment	<p>Competency may be assessed</p> <ul style="list-style-type: none"> <li>4.1 Off the job</li> <li>4.2 on the job</li> <li>4.3 During industrial attachment</li> </ul>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>