REPUBLIC OF KENYA

NATIONAL OCCUPATIONAL STANDARD

FOR

COMPUTER SCIENCE TECHNICIAN

KNQF LEVEL 6

(CYCLE 3)

PROGRAMME ISCED CODE: 0613 554 A.

TVET CDACC
P.O. BOX 15745-00100
NAIROBI

APPLY ARTIFICIAL INTELLIGENCE CONCEPTS

ISCED UNIT CODE: 0613 554 12A

UNIT CODE: ICT/OS/CS/CC/04/6/MA

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.

ELEMENT These describe the **key outcomes** which make up **workplace function**.	**PERFORMANCE CRITERIA** These are **assessable** statements which specify the required level of performance for each of the elements. ***(Bold and italicized terms are elaborated in the range.)***
1. Identify fundamentals of Artificial Intelligence	1.1 Fundamentals of artificial intelligence are applied. 1.2 The history of Artificial Intelligence is applied. 1.3 Foundations of Artificial Intelligence are applied. 1.4 Artificial Intelligence applications are implemented. 1.5 Intelligence agents are applied. 1.6 Artificial Intelligence applications in real life are applied.
2. Use problem solving techniques	2.1 Logical operators are applied. 2.2 Prepositional and Predicate logic are implemented. 2.3 ***Types of inferencing*** are applied. 2.4 Machine Learning is implemented. 2.5 ***Types of Machine Learning*** are applied. 2.6 Applications of different types of inferencing are deployed
3. Configure Python programming environment	3.1 Installation of Python is performed. 3.2 Python syntax is applied. 3.3 Python ***Data types*** are identified. 3.4 Control structures in Python are applied. 3.5 Functions in python are developed. 3.6 Object Oriented Python is applied. 3.7 ***Scientific Modules*** in Python are applied. 3.8 Applications are created using scientific modules
4. Develop Artificial Intelligence programs using python	4.1 Sci-Kit Learn is applied. 4.2 Machine Learning with K-Nearest Neighbours is implemented. 4.3 Machine Learning with Naïve Bayes Algorithm is applied.

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:	● Single ● Multiple ● Case based
2. Types of Machine Learning may include but not limited to:	● Supervised ● Unsupervised
3. Data types may include but not limited to:	● Integers ● Floats ● Strings ● Lists ● Tuple ● Sets ● Dictionaries
4. Scientific Modules may include but not limited to:	● Numpy ● Pandas ● Matplotlib

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	Assessment requires evidence that the candidate: 1.1 Explained applications of artificial intelligence 1.2 Explained the role of intelligence agents 1.3 Explained types of inferencing 1.4 Explained types of machine learning 1.5 Demonstrated installation of Python 1.6 Demonstrated Python syntax 1.7 Demonstrate data types in Python 1.8 Demonstrated use of control structures in Python 1.9 Demonstrated use of functions in Python 1.10 Demonstrated use of Object Oriented Python 1.11 Demonstrated use of scientific modules 1.12 Demonstrated machine learning
2. Resource Implications	The following resources should be provided: 2.1 Access to relevant workplace where assessment can take place 2.2 Appropriately simulated environment where assessment can take place 2.3 Resources relevant to proposed activity or task
3. Methods of Assessment	Competency may be assessed through: 3.1 Oral questioning 3.2 Practical tests 3.3 Observation 3.4 Written tests
4. Context of Assessment	Competency may be assessed 4.1 Off the job 4.2 on the job 4.3 During industrial attachment
5. Guidance information for assessment	5.1 Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.