



Model Curriculum

QP Name: Fundamentals of AIOT (Artificial Intelligence of Things)

QP Code: ELE/N7122

QP Version: 1.0

NSQF Level: 2.5

Model Curriculum Version: 1.0

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|---|--|
| Sector | Electronics |
| Sub-Sector | Industrial Automation |
| Occupation | Product Design - I&A |
| Country | India |
| NSQF Level | 2.5 |
| Aligned to NCO/ISCO/ISIC Code | NCO-2015/2512.0501 |
| Minimum Educational Qualification and Experience | 1. 9th Grade, No experience required 2. 8th Grade Pass and continuous education, No experience required |
| Pre-Requisite License or Training | NA |
| Minimum Job Entry Age | 18 years |
| Last Reviewed On | 27.08.2024 |
| Next Review Date | 27.08.2027 |
| NSQC Approval Date | 27.08.2024 |
| QP Version | 1.0 |
| Model Curriculum Creation Date | 27.08.2024 |
| Model Curriculum Valid Up to Date | 27.08.2027 |
| Model Curriculum Version | 1.0 |
| Maximum Duration of the Course | 210 Hours |

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

- Carry Out assembly and testing of AIoT systems
- Technical Assistant by Conducting Troubleshooting
- Junior AIoT Technician

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

| NOS and Module Details | Theory Duration | Practical Duration | On-the-Job Training Duration (Mandatory) | On-the-Job Training Duration (Recommended) | Total Duration |
|--|-----------------|--------------------|--|--|----------------|
| ELE/N7122: Fundamentals of AIOT (Artificial Intelligence of Things) | 90:00 | 120:00 | 00:00 | 00:00 | 210:00 |
| Module 1: Gaining an understanding of fundamental IoT concepts through applications | 15:00 | 30:00 | 00:00 | 00:00 | 45:00 |
| Module 2: Gaining an understanding of Data, Database, Dataset, Data Visualization, Data Science and Big Data | 30:00 | 30:00 | 00:00 | 00:00 | 60:00 |
| Module 3: Carry out troubleshooting for IoT devices | 30:00 | 30:00 | 00:00 | 00:00 | 60:00 |
| Module 4: Describe the machine learning process | 15:00 | 30:00 | 00:00 | 00:00 | 45:00 |
| Total Duration | 90:00 | 120:00 | 00:00 | 00:00 | 210:00 |

Module 1: Gaining an understanding of fundamental IoT concepts through applications

Mapped to ELE/N7122

Terminal Outcomes:

- Able to gain foundational understanding of IoT including basic principles and components
- able to identify important terms related to voltage, current, and electricity
- able to explain various circuit types and circuit diagrams
- Capable of combining and synthesizing knowledge from theory sessions to practically assemble and troubleshoot connections
- Able to build and demonstrate basic projects on hardware and digital platform independently
- able to show technical proficiency after finishing foundational assignments, provide logical justifications, and provide efficient solutions to issues
- Explain about diodes, darlington transistor, motors and their applications
- Reflect their learning on logic gates, compare and analyse using truth tables.
- Engage in several practical projects using hardware and digital platforms to learn about good conductors, current amplification, fuse usage, electricity conversion to other forms, the effects of series and parallel circuits on loads, and the use of logic gates, diodes, and capacitors.
- Develop critical thinking skills and the ability to draw well-reasoned conclusions.
- Improve their ability to formulate and communicate scientific findings of the projects performed.
- Understand Arduino interactive prototyping platform
- Program IoT using Arduino coding operations

| Duration: 15:00 | Duration: 30:00 |
|---|---|
| Theory – Key Learning Outcomes | Practical – Key Learning Outcomes |
| <ul style="list-style-type: none"> ● Introduction to Internet of things ● Discuss the evolution of IoT and the trends that have led to it ● Discuss uses and opportunity for electronic, coding and robotics design and prototyping ● Voltage, Current and Electricity fundamental and relation with each other ● Learn about breadboards ● Circuit and its components ● Explain the use of various types of electronic components like Power indicator, Power supply connector unit Buzzer, Resistor, White LED, Connectors, push button switch | <p>The trainees will be able to:</p> <p>Assembly Procedure & Basic Troubleshooting</p> <ul style="list-style-type: none"> ● Identify and match the physical component and their polarity ● Identify short circuits ● Attend to warnings and shock hazards ● Putting component backwards ● Loose Connections <p>Building Projects on Hardware and Digital Platform</p> <ul style="list-style-type: none"> ● Demonstrate the concept of open and closed circuits. ● Demonstrate the Push Button Switch, Buzzer function and how electricity is used to generate sound ● Demonstrate the LED function and how electricity is |

- Series and Parallel Circuits
 - Short Circuits
 - Open and Closed circuits
 - Use of Fuse
 - Polarity in circuits
 - Sound and Light energy
 - Troubleshoot circuit and other functionaries
 - Electronically controlled switches
 - Discussion on different types of transistors
 - Analyze existing IoT use cases and applications across industries
 - Good and Bad conductor of electricity
 - Learn about Diodes, Application and use of diode
 - darlington Transistor
 - Logic gates
 - Compare the behaviour with the truth table for OR gate/AND gate with different inputs
 - Draw a comparison table
 - Analyse real time applications using logics
 - Use WiFi for IoT Gateway
 - Evaluate the components and the connections that form an IoT network infrastructure
 - Different types of sensors and their uses
 - Introduce Arduino Coding
- Arduino Operators
- Different types of variables and sample codes checking output with Serial window.
 - Arithmetic operators
(Add, Sub, Mul, Div)
 - Relational Operators
(Less than, Greater than, Equal, Not Equal)
 - 'for' loop operations
 - 'while' loop usage
 - Conditional Statement 'if' and its sample codes
 - Decision Making with If—else
 - Multiple conditions if-else-if- else.

- used to light up an LED.
- Demonstrate how LED's like one-way valves let electricity flow only in one direction.
 - Demonstrate conductor and insulator of electricity.
 - Demonstrate the use of fuse to make electrical circuits safer.
 - Demonstrate the function of a Resistor in series with a Buzzer.
 - Demonstrate how a series Resistor is used to protect an LED.
 - Demonstrate how electric circuits can be built to turn on multiple loads at a time without affecting the performance of the other load.
 - Demonstrate the use of electronically controlled switches like Transistors using Push Button Switch for Input and Buzzer for Output.
 - Demonstrate how a transistor as a switch can control an LED output.
 - Get creative with circuits, demonstration of Push Button Switch in reverse function with Buzzer for Output.
 - To try and see for yourself if the switch reverse function works for an LED output.
 - Demonstrate if the human body is a good conductor of electricity using human touch as Input and Buzzer as Output.
 - Demonstrate the amplification of current via darlington Transistor with LED as Output.
 - Demonstrate the use of fuse to make electrical circuits safer with a Motor Output.
 - Demonstrate how electricity is converted into Sound, Light and Mechanical energy at the same time.
 - Demonstrate the characteristics of voltage, current, and resistance in a parallel circuit.
 - Demonstrate the characteristics of voltage, current, and resistance in a parallel circuit.
 - Demonstrate the effect of series and parallel circuits on loads.
 - Demonstrate the use of a free wheeling diode alongside the DC Motor in the DC Motor Block LU4.
 - Demonstrate the use of a capacitor alongside the DC Motor in the DC Motor Block LU4.
 - Demonstrate This OR That logic using Inputs as Push Button Switches and Output as Buzzer.

Arduino Functions:

- Structure of Function
- User defined functions declaration, call and return type.
- Return value and arguments
- Digital write, Digital read predefined Functions understanding and usage

Coding aspects

- Understanding Debounce
- Buzzer interfacing:(Output)
- Connecting buzzer with Arduino
- Operating buzzer with delay

- Demonstrate This OR That logic using Inputs as Push Button Switches and Output as DC Motor.
- Demonstrate This OR That logic using Inputs as Push Button Switches and Output as LED.
- Demonstrate This AND That logic using Inputs as Push Button Switches and Output as Buzzer.
- Demonstrate This AND That logic using Inputs as Push Button Switches and Output as DC Motor.
- Demonstrate This AND That logic using Inputs as Push Button Switches and Output as LED.

Arduino Installation

- Open source platform
- Download from Google , <https://www.arduino.cc/en/software>
- Getting Started with IDE
- Arduino Sketch Structure and flow
- Sketch Main loop and Demonstration
- Arduino Sketch variable Declaration
- Few rules to declare Variables
- Sketch Setup configuration

Getting started with Arduino

- Arduino Boards (UNO, Nano, Mega)
- USB cable physical connection with board
- understanding Arduino Pins and their usage for programming
- Access Pins (input/Output)and develop sample source code
- Explanation on logic High and Logic Low.

Start Building Projects

- Practice on IDE
- Open new Sketch ,
- save, compile
- adding libraries,
- Checking Serial window Print operations
- Testing Arithmetic Operations with simple codes, Sketch Variable, Setup and Main loop build and compile.
- Practice codes with relational Operators and check outputs on Serial Window.
- Checking increment count, Decrement count outputs with Serial window
- checking input lower case character or uppercase character
- Finding Marks Average and Grades of students with Marks

- True or false results example code testing with Serial window.
- Board and Port selection from IDE
- Checking existence examples from IDE.(compile and Upload)
- Breadboard construction
- Understanding Power supply and its Terms voltage, current, Resistance , wires, Jumpers,.
- Demonstrate the Push Button Switch, Buzzer and generate sound with Arduino Sketch
- Generate Red flashing light
- Generate Green flashing light
- Generate Blue flashing light
- Generate secondary color Yellow with the sum of two primary colors Red and Green
- Generate secondary color Magenta with the sum of two primary colors Red and Blue
- Generate secondary color Cyan with the sum of two primary colors Green and Blue
- Generate White light with the sum of three primary colors Red, Green and Blue
- Generate a rainbow of colors, each with a unique Buzzer Sound.
- Weather Monitoring over IoT
- Gas Leakage Detector over IoT
- Smart Irrigation over IoT

Classroom Aids:

Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop

Tools, Equipment and Other Requirements

AIoT Workstation/Kit, Sensor and accessories, Multimeter, Tool Box includes cutter, screwdriver, nut driver, nut & bolts etc. Batteries/Power Bank

Module 2: Gaining an understanding of Data, Database, Dataset, Data Visualization, Data Science and Big Data

Mapped to ELE/N7122

Terminal Outcomes:

- Use selected AI applications online to explore various types of AI
- Recognize AI applications in everyday life
- Identify the various types of problems that AI can solve
- Breakdown a human action into parts to identify learning requirements and processes involved
- Identify the various components of human learning
- Identify the use of data in various given activities and applications
- Recognize different types of data and explore how the same data can be represented in different ways
- Analyze and extract information from represented data as pictures, symbols and diagrams
- Investigate how digital systems represent text, image and audio data in binary
- Explain the role of Algebra, Probability, and Statistics in AI
- Explain the need for data visualization in AI
- Explain the problem-solving process of AI
- Prepare a simple algorithm related to a daily life activity
- Train or teach existing AI applications such as voice recognition or face recognition software
- Create simple codes using Python language

| Duration: 30:00 | Duration: 30:00 |
|--|--|
| Theory – Key Learning Outcomes | Practical – Key Learning Outcomes |
| <ul style="list-style-type: none"> ● Human Intelligence Artificial Intelligence ● Need for AI ● Applications of AI Key components of AI ● Future of AI ● Human learning process ● Computer or Machine Learning ● Learning human abilities ● Speech Recognition ● Computer Vision ● Introduction to Data ● Datasets ● Types of Data Database ● Data Science and Big Data ● Computational Data | <ul style="list-style-type: none"> ● Recognize AI applications in everyday life ● Identify the various types of problems that AI can solve ● Applications of AI - Gaming, Intelligent Robots, etc. ● Teachable Machine - carry out an activity to learn how to train a computer ● Supervised Learning ● Unsupervised Learning ● Reinforcement Learning ● Learning human abilities ● Conversational AI ● Speech Recognition ● Computer Vision ● Data Versus Information ● Datasets - Training Data, Testing Data ● How to use QuickDraw ● Autodraw ● Identify Binary and Nominal data from the data you |

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| <ul style="list-style-type: none"> • Role of Algebra and Probability in AI • Role of statistics in AI • Data Visualization • Introduction of problem solving and algorithms • Pseudocode – writing basic algorithms Searching and sorting algorithms • AI and computer programming Scratch • Python • Top AI languages in 2020 • Ethics and AI • Here’s more for the AI Enthusiast • Acknowledgement | <p>collected and recorded in a table</p> <ul style="list-style-type: none"> • Spreadsheet • Creating a Database • Sending Secret Messages • Count the Dots—Binary Numbers • Explain the role of Algebra, Probability, and Statistics in AI • Prepare a simple graph from data using a spreadsheet • Role of Statistics in AI • Data Visualization - create a Bar Chart in relation to the 2 variables • Represent the steps of daily life activity in a flowchart • Choosing The Best Solution By Comparing Algorithms • Pseudocode – Writing Basic Algorithms • Various languages help us in communicating with computers • Train or teach existing AI applications such as voice recognition or face recognition software • Create simple codes using Python language • Scratch • Create AI in Scratch and find out how machine learning really works! • Why Python for AI? • How to Install Python for Windows • Ethical Issues |
| <p>Classroom Aids:</p> | |
| <p>Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Software tools, Internet Connection, Chart paper and sketch pens</p> | |
| <p>Tools, Equipment and Other Requirements</p> | |
| <p>NA</p> | |

Module 3: Carry out troubleshooting for IoT devices

Mapped to ELE/N7122

Terminal Outcomes:

- Classify and categorise sensors commonly used in IoT based on their sensing principles, applications, and characteristics.
- Ability to select the most appropriate sensors for specific tasks
- Understand RF and Bluetooth communication
- Hands-on Build and demonstrate Robot with multiple inputs
- Classify and categorise IoT applications based on their domains and use cases
- Develop the skills to calibrate sensors and conduct tests to ensure their accuracy and reliability in IoT applications.
- Do assembly of circuit connections and troubleshooting.
- Learn how to adapt and optimise IoT systems to address changing requirements and challenges within different applications.
- Develop teamwork and communication skills

| Duration: 30:00 | Duration: 30:00 |
|--|--|
| Theory – Key Learning Outcomes | Practical – Key Learning Outcomes |
| <ul style="list-style-type: none"> ● Different types of sensors and their uses in IoT applications ● Demonstrate how to measure distance using suitable sensors. ● Demonstrate the use of the contact and non-contact sensor. ● Application of touch sensor ● Analyse use of magnetic switch ● Analyse and use of LDR Sensor, Moisture Sensor, Flame Sensor, Gas Sensor, Humidity Sensor, Temperature Sensor, Motion Detector Sensor, Noise Detector Sensor, etc. ● Analyse and use of Obstacle Sensor ● Analyse and use of Infrared and Photodiode ● Analyse and use of Ultrasonic Sensor <ul style="list-style-type: none"> ● 2 wheel drive | <ul style="list-style-type: none"> ● Demonstrate the Dual LED function. ● Demonstrate the RGB LED function. ● Demonstrate the concept of open and closed circuits. ● To reiterate the Darlington Transistor concept with DC Motor as Output. ● Demonstrate the amplification of current via darlington Transistor with Flashing LED as Output. ● Demonstrate the function of Resistor 1K with a Dual LED Output. ● To study different LED Outputs. ● Demonstrate the Output using a Dual LED, when there is a change in the Input. ● Demonstrate the Output using an RGB LED, when there is a change in the Input. ● Demonstrate the use of electronically controlled switches like Transistors using Push Button Switch for Input and Flashing LED for Output. <p>Start Building Sensor Projects</p> <ul style="list-style-type: none"> ● Demonstrate the working of a Reed Sensor with Buzzer Output. |

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| <ul style="list-style-type: none"> ● Movements of the different robots ● Features & Sensor used <p>RF Communication</p> <ul style="list-style-type: none"> ● Radio frequency range from Spectrum ● Application with RF wireless Communication ● Data Encode & Decode ● Modulation & Demodulation <p>Bluetooth Communication</p> <ul style="list-style-type: none"> ● Transmitter & Receiver Pairing ● App & Voice control | <ul style="list-style-type: none"> ● Demonstrate the working of a Reed Sensor with DC Motor Output. ● Demonstrate the working of a Reed Sensor Z9 with an LED Output. ● Demonstrate the working of a Reed Sensor Z9 with a Flashing LED Output. ● Demonstrate the working of a Reed Sensor Z9 with a Dual LED Output. ● Demonstrate the working of an LDR Sensor, Resistor 10K and Transistor BC 557. ● Demonstrate the working of an LDR Sensor with a Fan Output. ● Demonstrate the working of an LDR Sensor with an LED Output. ● Demonstrate the working of an LDR Sensor with a Flashing LED. ● Demonstrate the working of an LDR Sensor with a Dual LED. ● Night lamp control Morning Alarm over IoT ● Object counting Dashboard over IoT ● Smart Alarm over IoT ● Motion Detector over IoT ● Unauthorised Detection over IoT ● Heart Beat Counter over IoT ● Patient Body temperature monitoring over IoT ● Ultrasonic distance measurement over IoT ● Distance Alert over IoT ● Flame Detector over IoT ● Noise Detector over IoT ● Home Automation over IoT |
| <p>Classroom Aids:</p> | |
| <p>Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop</p> | |
| <p>Tools, Equipment and Other Requirements</p> | |
| <p>AIoT Workstation/Kit, Sensor and accessories, Multimeter, Tool Box includes cutter, screwdriver, nut driver, nut & bolts etc. Batteries/Power Bank</p> | |

Module 4: Describe the machine learning process

Mapped to ELE/N7122

Terminal Outcomes:

- State various areas where AI is being applied
- List the various technologies and tools used in AI
- State the key steps involved in building AI
- List the key skills required to build AI solutions
- Explain how graphical programming works and concepts like loops and conditional statements
- Use a pre-trained model to perform a simple project using graphical programming
- State logically the likely impacts of AI technology on society
- Explain potential sources of bias in AI decision making
- Critically explore the positive and negative impacts of an AI system
- Research and present key ethical concerns related to AI development and use in various areas of application
- Use tools and templates for evaluating ethical considerations and bias in the AI project or application
- Differentiate between artificial intelligence and machine learning.
- Describe the machine learning process
- List the type of tools used at different stages of the machine learning process
- Explain how neural networks and deep learning works
- Build machine learning solutions using MLaaS platforms
- Explain what is NLP and how it works
- Differentiate between NLP and NLU
- List common applications of NLP
- Explain what Computer Vision (CV) is and how it works.
- List common applications of CV
- Describe the working and application of Optical Character Recognition (OCR)
- Use OpenCV to read and image, display an image, resize an image
- Write clean, logical code
- Apply python codes to simple machine learning projects
- List the key machine learning algorithms for supervised, unsupervised and reinforcement learning
- State applications of key machine learning algorithms
- Train and evaluate a classification, regression and clustering model algorithm

| Duration: 15:00 | Duration: 30:00 |
|---|--|
| Theory – Key Learning Outcomes | Practical – Key Learning Outcomes |
| <ul style="list-style-type: none"> ● AI Applications ● Process of Building an AI ● Skills to Build AI Solutions ● What does 'Ethical AI' mean? ● Fairness ● Robustness ● Privacy ● Explainability ● Governance | <ul style="list-style-type: none"> ● List the key skills required to build AI solutions ● Project: Graphical Programming and Air Draw ● Graphical Programming and its Elements ● Graphical Programming Platforms with AI ● Understand how graphical programming works ● PictoBlox, Machine Learning for Kids, Stretch ● Steps with Pictoblox Platform ● Steps with Machine Learning for Kids Platform ● Steps with Stretch 3 Platform |

| | |
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| <ul style="list-style-type: none"> ● Introduction to Machine Learning ● Gathering Data ● Preparing the Data ● Choosing the Model ● Neural Networks and Deep Learning ● Introduction to Maths for ML ● Training ● Evaluating ● Parameter Tuning ● Prediction ● Machine Learning as a Service ● Introduction to Natural Language Processing (NLP) ● Natural Language Understanding ● Application of NLP ● Use Cases ● How Does NLP work ● Elements of NLP ● Introduction to computer vision Computer Vision Applications ● Challenges of Computer Vision Optical Character Recognition ● OpenCV ● Project: Face Recognition using Scratch ● Project: Attendance System using Face Recognition ● Databases SQL ● Introduction To Python ● Integrated Development Environment (IDE) ● Core Programming Concepts ● Essential Data Science Libraries ● Troubleshooting Defects In Python Code ● Practice For Writing Code ● Introduction to Machine Learning Algorithms ● Algorithms Used in Supervised Learning ● Algorithms Used in Unsupervised Learning ● Algorithms Used in Reinforcement Learning | <ul style="list-style-type: none"> ● Analyze the data using a model - Choose the algorithms, Train the model, Evaluate the model ● Use tools and templates for evaluating ethical considerations and bias in the AI project or application ● List the type of tools used at different stages of the machine learning process ● Data Collection Activities ● Various Tools for Data Collection ● Identifying Relevant Data and Removing Irrelevant Data ● The topology of a neural network ● Deep Learning ● Machine learning as a service (MLaaS) ● List common applications of NLP ● Text to speech using Scratch ● Chatbot in Scratch ● Project: Face Recognition using Scratch ● Project: Attendance System using Face Recognition ● Capturing and Recording Data ● Sorting Data, Filtering Data, Applying Simple Formulae ● Relational Databases ● Installing MySQL Server ● Basic SQL Commands ● Creating A Database ● Updating Records in SQL ● Downloading Jupyter Notebook ● Practice for Writing Code ● Try to train and evaluate a regression model by using 2 popular Machine Learning Platforms, AWS SageMaker and Microsoft Azure. ● Try to train and evaluate a clustering model by using two popular Machine Learning Platforms, AWS SageMaker and Microsoft Azure. |
| <p>Classroom Aids:</p> | |
| <p>Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Software tools, Internet Connection, Chart paper and sketch pens</p> | |
| <p>Tools, Equipment and Other Requirements</p> | |
| <p>NA</p> | |

Annexure

Trainer Requirements

| Trainer Prerequisites | | | | | | |
|--|---|------------------------------|--|---------------------|----------------|---------|
| Minimum Educational Qualification | Specialization | Relevant Industry Experience | | Training Experience | | Remarks |
| | | Years | Specialization | Years | Specialization | |
| BE/B.Tech | Electrical/ Electronics/ Mechanical | 0 | Relevant Industry Intelligence of Things | 1 | Training | |
| Diploma/ITI/ Certified in relevant CITS Trade | Electrical/ Electronics/ Mechanical | 1 | Relevant Industry Intelligence of Things | 1 | Training | |

| Trainer Certification | |
|---|--|
| Domain Certification | Platform Certification |
| Fundamentals of AIOT (Artificial Intelligence of Things), ELE/N7122, version 1.0". Minimum accepted score is 80%. | Recommended that the Trainer is certified for the Fundamentals of AIOT (Artificial Intelligence of Things) "Trainer (VET and Skills)", mapped to the Qualification Pack: "MEP/Q2601, V2.0", with minimum score of 80% |

Assessor Requirements

| Assessor Prerequisites | | | | | | |
|--|---|------------------------------|-----------------------|--------------------------------|----------------|---------|
| Minimum Educational Qualification | Specialization | Relevant Industry Experience | | Training/Assessment Experience | | Remarks |
| | | Years | Specialization | Years | Specialization | |
| BE/B.Tech | Electrical/ Electronics/ Mechanical | 1 | Relevant Industry IOT | 1 | Training | |
| Diploma/ITI/ Certified in relevant CITS Trade | Electrical/ Electronics/ Mechanical | 2 | Relevant Industry IOT | 1 | Training | |

| Assessor Certification | |
|--|--|
| Domain Certification | Platform Certification |
| “Fundamentals of AIOT (Artificial Intelligence of Things), ELE/N7122, version 1.0”. Minimum accepted score is 80%. | Recommended that the Assessor is certified for the Fundamentals of AIOT (Artificial Intelligence of Things) “Assessor (VET and Skills)”, mapped to the Qualification Pack: “MEP/Q2701 , V2.0”, with minimum score of 80% |

Assessment Strategy

- Assessment System Overview:
 - Batches assigned to the assessment agencies for conducting the assessment on SDMS/SIP or email
 - Assessment agencies send the assessment confirmation to VTP/TC looping SSC
 - Assessment agency deploys the ToA certified Assessor for executing the assessment
 - SSC monitors the assessment process & records
- Testing Environment:
 - Confirm that the centre is available at the same address as mentioned on SDMS or SIP
 - Check the duration of the training.
 - Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
 - If the batch size is more than 30, then there should be 2 Assessors.
 - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
 - Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
 - Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.

- Check the availability of the Lab Equipment for the particular Job Role.
3. Assessment Quality Assurance levels / Framework:
- Question papers created by the Subject Matter Experts (SME)
 - Question papers created by the SME verified by the other subject Matter Experts
 - Questions are mapped with NOS and PC
 - Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
 - Assessor must be ToA certified & trainer must be ToT Certified
 - Assessment agency must follow the assessment guidelines to conduct the assessment
4. Types of evidence or evidence-gathering protocol
- Time-stamped & geotagged reporting of the assessor from assessment location
 - Centre photographs with signboards and scheme specific branding
 - Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
 - Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos
5. Method of verification or validation:
- Surprise visit to the assessment location
 - Random audit of the batch
 - Random audit of any candidate
6. Method for assessment documentation, archiving, and access
- Hard copies of the documents are stored
 - Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
 - Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

References

Glossary

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| Sector | Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests. |
| Sub-sector | Sub-sector is derived from a further breakdown based on the characteristics and interests of its components. |
| Occupation | Occupation is a set of job roles, which perform similar/ related set of functions in an industry. |
| Job role | Job role defines a unique set of functions that together form a unique employment opportunity in an organisation. |
| Occupational Standards (OS) | OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts. |
| Performance Criteria (PC) | Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task. |
| National Occupational Standards (NOS) | NOS are occupational standards which apply uniquely in the Indian context. |
| Qualifications Pack (QP) | QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code. |
| Unit Code | Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N' |
| Unit Title | Unit title gives a clear overall statement about what the incumbent should be able to do. |
| Description | Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for. |



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| Scope | Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required. |
| Knowledge and Understanding (KU) | Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard. |
| Organisational Context | Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility. |
| Technical Knowledge | Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities. |
| Core Skills/ Generic Skills (GS) | Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles. |
| Electives | Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives. |
| Options | Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options. |

Acronyms and Abbreviation

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|-------------|---|
| NOS | National Occupational Standard(s) |
| NSQF | National Skills Qualifications Framework |
| QP | Qualifications Pack |
| TVET | Technical and Vocational Education and Training |
| IPR | Intellectual Property Rights |