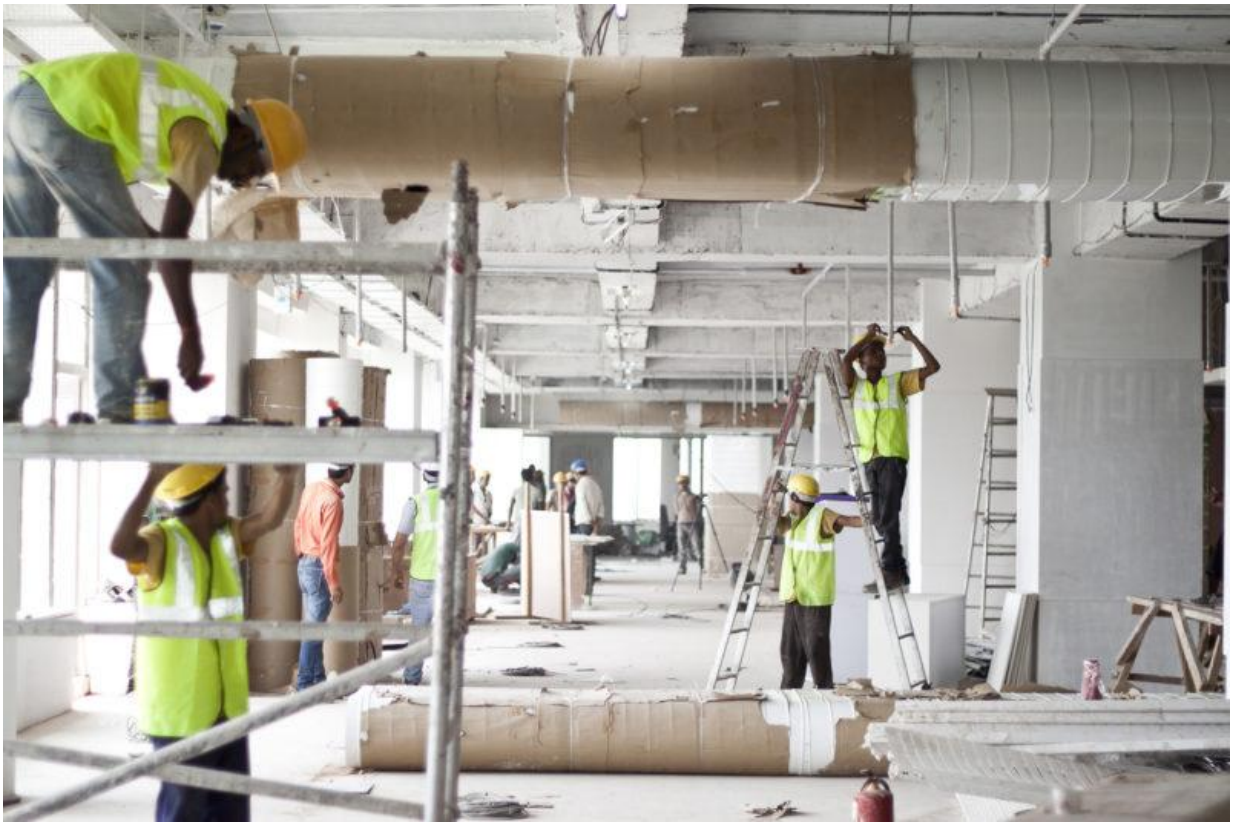

Model Curriculum

QP Name:	**MEP Executive** **Electives: Mechanical Systems / Electrical Systems / Plumbing Systems**
QP Code:	**ICE/CON/Q1501**
Version:	**1.0**
NSQF Level:	**3**
Model Curriculum Version:	**1.0**

The Institution of Civil Engineers Society (ICES)
301-303, Suncity Trade Tower, Sector-21, Gurugram, Haryana || Email: ceo@iceskills.in

Table of Contents

Training Parameters

Sector	Construction		
Sub-Sector	Real Estate and Infrastructure Construction		
Occupation	MEP (Mechanical, Electrical and Plumbing)		
Country	India		
NSQF Level	3		
Aligned to NCO/ISCO/ISIC Code	NCO-2015/ 7412.0202, NCO-2015/7412.0200, NCO-2015/ 7411.0100, NCO-2015/ 7126.0103, NCO-2015/ 7126.0107		
Minimum Educational Qualification and Experience	**S. No.**	**Academic/Skill Qualification (with Specialization - if applicable)**	**Required Experience (with Specialization - if applicable)**
	1	10th Grade pass	
	OR		
	2	8th Grade pass	2 years of Relevant Industry Experience
	OR		
	3	5th Grade pass	5 years of Relevant Industry Experience
	OR		
	4	Previous relevant Qualification of NSQF Level 2	1 year of relevant experience
	OR		
	5	Previous relevant Qualification of NSQF Level 2.5	6 months of relevant experience
Pre-Requisite License or Training	Not Applicable		
Minimum Job Entry Age	As per Govt. Norms		
Last Reviewed On	07-10-2025		
Next Review Date	07-10-2028		
NSQC Approval Date	07-10-2025		
QP Version	1.0		
Model Curriculum Creation Date	07-10-2025		
Model Curriculum Valid Up to Date	07-10-2028		
Model Curriculum Version	1.0		
Minimum Duration of the Course	300 Hours		
Maximum Duration of the Course	660 Hours		

Program Overview

This section summarises 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 to:

- Work independently as an assistant to MEP supervisors/technicians for mechanical, electrical and plumbing activities at construction sites.
- Identify, handle, maintain and store MEP tools/equipment/materials safely as per industry standards.
- Read and correlate MEP drawings with actual site conditions to support installation marking and execution.
- Assist in installation, testing and commissioning of HVAC ducts, piping networks, plumbing fixtures and electrical wiring systems.
- Assist in preventive, predictive and corrective maintenance of MEP systems using standard procedures.
- Follow safety protocols, PPE usage, lock-out/tag-out, electrical and mechanical hazard control and emergency response.
- Record work progress, inspection notes, material status and operational parameters in supervisor-prescribed formats.
- Demonstrate professional behaviour, teamwork, discipline, communication and accountability in real job situations.

Compulsory Modules:

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

NOS and Module Details	Theory Duration (in Hours)	Practical Duration (in Hours)	On-the-Job Training Duration (Mandatory) (in Hours)	On-the-Job Training Duration (Recommended) (in Hours)	Total Duration (in Hours)
ICE/CON/N1523: Identify Tools, Equipment and Materials Relevant to MEP Work at a Construction Site NOS Version: 1.0 NSQF Level: 3	**10:00**	**10:00**	**10:00**	**00:00**	**30:00**
Module 1: Introduction to the Construction Industry and the job role "MEP Executive"	02:00	00:00	00:00	00:00	02:00
Module 2: Basic Tools and Equipment Handling	08:00	10:00	10:00	00:00	28:00
ICE/CON/N1524: Read and Interpret MEP System Drawings and Specifications NOS Version: 1.0 NSQF Level: 3	**10:00**	**15:00**	**05:00**	**00:00**	**30:00**
Module 3: Read and Interpret MEP Drawings	10:00	15:00	05:00	00:00	30:00
ICE/CON/N9901: Implement Safe Work Practices and Environmental Stewardship at Construction Sites NOS Version: 1.0 NSQF Level: 4	**10:00**	**20:00**	**00:00**	**00:00**	**30:00**
Module 4: Workplace Safety and Health Compliance	05:00	10:00	00:00	00:00	15:00
Module 5: Environmental Protection and Emergency Preparedness	05:00	10:00	00:00	00:00	15:00
DGT/VSQ/N0101: Employability Skills (30 Hours) NOS Version No.: 1.0 NSQF Level: 2	**30:00**	**00:00**	**00:00**	**00:00**	**30:00**
Module 6: Employability Skills (30 Hours)	30:00	00:00	00:00	00:00	30:00
Total Duration	**60:00**	**45:00**	**15:00**	**00:00**	**120:00**

Elective Modules:

Elective 1: Mechanical Systems

NOS and Module Details	Theory Duration (in Hours)	Practical Duration (in Hours)	On-the-Job Training Duration (Mandatory) (in Hours)	On-the-Job Training Duration (Recommended) (in Hours)	Total Duration (in Hours)
ICE/CON/N1517: Assist in Installation of Mechanical Systems and HVAC Ducts NOS Version: 1.0 NSQF Level: 3	**30:00**	**50:00**	**10:00**	**00:00**	**90:00**
Module 7: Basic Mechanical Systems Assembly and Installation	15:00	25:00	05:00	00:00	45:00
Module 8: Fundamentals of Ducting and Ventilation Installations	15:00	25:00	05:00	00:00	45:00
ICE/CON/N1518: Assist in Repair, Maintenance and Testing of Mechanical Systems NOS Version: 1.0 NSQF Level: 3	**30:00**	**55:00**	**05:00**	**00:00**	**90:00**
Module 9: Mechanical Maintenance and Equipment Installation	15:00	25:00	05:00	00:00	45:00
Module 10: Mechanical System Start-Up and Shutdown	15:00	25:00	05:00	00:00	45:00
Total Duration	**60:00**	**105:00**	**15:00**	**00:00**	**180:00**

Elective 2: Electrical Systems

NOS and Module Details	Theory Duration (in Hours)	Practical Duration (in Hours)	On-the-Job Training Duration (Mandatory) (in Hours)	On-the-Job Training Duration (Recommended) (in Hours)	Total Duration (in Hours)
ICE/CON/N1519: Assist in Electrical wiring, LV Installations and Earthing Systems NOS Version: 1.0 NSQF Level: 3	**30:00**	**50:00**	**10:00**	**00:00**	**90:00**
Module 11: Electrical Wiring and LV Installations	10:00	15:00	03:00	00:00	28:00
Module 12: Earthing System Installation and Electrical Testing	10:00	20:00	04:00	00:00	34:00
Module 13: Post-Installation Electrical Tasks	10:00	15:00	03:00	00:00	28:00
ICE/CON/N1520: Assist in Installation, Repair and Maintenance of Electrical Systems NOS Version: 1.0 NSQF Level: 3	**30:00**	**55:00**	**05:00**	**00:00**	**90:00**
Module 14: Preparing and Installing Temporary Electrical Systems	10:00	15:00	01:00	00:00	26:00
Module 15: Maintaining Temporary Electrical Systems	10:00	20:00	02:00	00:00	32:00
Module 16: Post-Installation and Maintenance Activities	10:00	20:00	02:00	00:00	32:00
Total Duration	**60:00**	**105:00**	**15:00**	**00:00**	**180:00**

Elective 3: Plumbing Systems

NOS and Module Details	Theory Duration (in Hours)	Practical Duration (in Hours)	On-the-Job Training Duration (Mandatory) (in Hours)	On-the-Job Training Duration (Recommended) (in Hours)	Total Duration (in Hours)
ICE/CON/N1521: Assist in Installation of Plumbing Systems NOS Version: 1.0 NSQF Level: 3	**30:00**	**50:00**	**10:00**	**00:00**	**90:00**
Module 17: Traditional Plumbing System Installation	15:00	25:00	05:00	00:00	45:00
Module 18: IoT-Based Water Management Systems Installation	15:00	25:00	05:00	00:00	45:00
ICE/CON/N1522: Assist in Repair and Maintenance of Plumbing Systems NOS Version: 1.0 NSQF Level: 3	**30:00**	**55:00**	**05:00**	**00:00**	**90:00**
Module 19: Repairing and Maintaining Plumbing Systems	15:00	25:00	05:00	00:00	45:00
Module 20: Green Plumbing and Sustainable Water Management	15:00	25:00	05:00	00:00	45:00
Total Duration	**60:00**	**105:00**	**15:00**	**00:00**	**180:00**

Module Details

Module 1: Introduction to the Construction Industry and the job role "MEP Executive"

Mapped to ICE/CON/N1523, v1.0

Terminal Outcomes:

- Explain the importance of Construction Industry.
- Describe the responsibilities and career opportunities of an MEP Executive.

Duration: 02:00	**Duration: 00:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Define the Construction Industry. • Describe the main sectors within the construction industry and their impact on infrastructure development. • Discuss the scope of employment in the Construction Industry. • Explain the role and responsibilities of an MEP Executive. • Discuss the skills and qualifications necessary for a career as an MEP Executive. • Identify various career opportunities available for an MEP Executive.	
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
NA	

Module 2: Basic Tools and Equipment Handling

Mapped to ICE/CON/N1523, v1.0

Terminal Outcomes:

- Identify and describe the basic tools and equipment used in MEP work.
- Demonstrate the safe handling, usage and maintenance of tools and equipment.

Duration: 08:00	**Duration: 10:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the use of basic hand tools such as spanners, screwdrivers, hammers and pliers. • Explain the purpose and functions of power tools such as drills, grinders and cutting machines. • Explain the role of testing tools like multimeters, clamp meters and pressure gauges in MEP tasks. • Describe proper techniques for handling and operating different tools. • Describe the importance of selecting the right tool for a specific MEP task. • Identify the appropriate storage requirements for hand tools, power tools and testing equipment to prevent damage. • Describe the maintenance procedures for cleaning and maintaining different tools and equipment. • Discuss the significance of safety protocols when handling MEP tools and equipment. • List potential hazards associated with the use of MEP tools and describe methods to mitigate risks.	• Show how to identify and differentiate between basic hand tools such as wrenches, pliers and screwdrivers. • Show how to identify power tools such as drills and cutters and describe their specific applications. • Demonstrate the proper selection of tools for different MEP tasks. • Demonstrate the correct technique for handling and using hand tools to avoid injury. • Show the correct operation of power tools under supervision while following safety guidelines. • Show how to properly store tools and equipment in designated areas after use. • Demonstrate the correct method for storing power tools and ensuring they are not damaged. • Show how to inspect tools regularly for signs of wear and tear. • Demonstrate the proper cleaning process for different tools to prevent rust and damage. • Show how to safely check tools and equipment for compliance with safety standards before use. • Demonstrate the proper use of PPE such as gloves, goggles and protective gear while handling tools. • Show how to report damaged tools to supervisors for repair or replacement. • Demonstrate the safe handling and usage of measuring and testing equipment. • Show how to follow safety procedures while operating tools to prevent accidents.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	

Hand tools such as screwdrivers, pliers, wrenches, spanners, hammers, measuring tapes, levels, pipe cutters, hacksaws, drills and power tools like angle grinders and impact drivers.

Module 3: Read and Interpret MEP Drawings

Mapped to ICE/CON/N1524, v1.0

Terminal Outcomes:

- Explain the significance of MEP drawings and symbols in construction.
- Demonstrate the ability to read and interpret MEP drawings accurately.

Duration: 10:00	**Duration: 15:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the role of MEP (Mechanical, Electrical and Plumbing) drawings in coordinating construction activities. • Define the types of MEP drawings, such as mechanical, electrical and plumbing layouts and their applications. • Discuss the significance of legends, symbols, scales and annotations in understanding MEP drawings. • List common symbols and abbreviations used in MEP systems for mechanical, electrical and plumbing components. • Explain the importance of adhering to safety standards, codes and regulations when interpreting MEP drawings. • Discuss the need for accurate documentation and communication in conveying technical information.	• Demonstrate identifying mechanical, electrical and plumbing layouts in MEP drawings. • Show how to interpret symbols, abbreviations and notations specific to mechanical, electrical and plumbing systems. • Demonstrate locating key components such as HVAC units, electrical panels, wiring, pipes and drainage points. • Show the process of reading scales and dimensions to understand spatial arrangement and component placement. • Demonstrate extracting technical details like material specifications and installation guidelines from drawings. • Show verifying site conditions against MEP drawings to identify discrepancies. • Demonstrate updating records to reflect changes or corrections in MEP plans. • Show communicating findings and clarifications to supervisors and team members. • Demonstrate identifying safety symbols and compliance markers for safe work practices. • Show how to report unclear or missing details for further clarification
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
MEP blueprints, technical drawing sheets, drafting tools such as T-squares, compasses, protractors, rulers and CAD software for digital interpretation.	

Module 4: Workplace Safety and Health Compliance

Mapped to ICE/CON/N9901, v1.0

Terminal Outcomes:

- Explain workplace hazards and safety measures in construction.
- Demonstrate the use of personal protective equipment (PPE) and emergency response procedures.

Duration: 05:00	**Duration: 10:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the importance of Safety, Health and Environment (SHE) guidelines in maintaining a safe workplace. • Describe how company policies help in ensuring safety and compliance on construction sites. • Explain the correct procedure for reporting safety incidents or workplace hazards. • Describe the reporting structure for safety concerns within a construction site. • Identify the key personnel responsible for workplace safety, such as the safety officer and site engineer. • Explain the roles and responsibilities of the safety officer in maintaining site safety. • List different types of construction hazards, including chemical, physical and ergonomic risks. • Describe the potential impact of construction hazards on workers' health and safety. • Discuss the correct use of personal protective equipment (PPE) such as helmets, gloves, safety boots and harnesses. • Explain how to properly maintain PPE to ensure its effectiveness and durability.	• Show the process to identify common construction site hazards, including falling objects, slippery surfaces and electrical risks. • Demonstrate the process of evaluating potential risks associated with workplace hazards. • Show how to report identified hazards to a supervisor or safety officer using the correct reporting procedures. • Demonstrate the proper use and maintenance of personal protective equipment (PPE), including helmets, gloves, safety boots and harnesses. • Show the ability to follow safety signage and barricading instructions to avoid restricted or hazardous areas. • Demonstrate safe lifting techniques and the proper use of lifting tools to minimize strain and prevent injuries. • Demonstrate proper personal hygiene practices, including the use of clean drinking water and designated rest areas. • Show how to recognize and report health symptoms such as respiratory issues or heatstroke to the designated authority. • Demonstrate safe handling and disposal procedures for hazardous materials such as asbestos and chemicals to ensure workplace safety.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Safety helmets, gloves, safety boots, safety harnesses, high-visibility vests, safety goggles, ear protection, dust masks, fire extinguishers, first aid kits, emergency response charts, barricading tape, safety cones, hazard signage, lifting belts, lifting tools such as pulleys and ropes, spill control kits, asbestos handling kits, chemical-resistant gloves, chemical spill absorbents, lockout/tagout (LOTO) kits, electrical insulating mats, hand wash stations and waste disposal bins for hazardous materials.	

Module 5: Environmental Protection and Emergency Preparedness

Mapped to ICE/CON/N9901, v1.0

Terminal Outcomes:

- Describe sustainable construction practices and waste management techniques.
- Explain emergency preparedness measures for fire, chemical spills and natural disasters.

Duration: 05:00	**Duration: 10:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the importance of first aid in construction site safety. • Describe basic first aid procedures for common workplace injuries such as cuts, burns and fractures. • Identify the steps to take in case of a fire emergency. • Explain how to use fire extinguishers and other firefighting equipment. • Describe the role of emergency response teams in handling accidents and fires. • Explain the importance of environmental regulations in construction work. • Describe dust control measures used to minimize air pollution on construction sites. • Discuss proper waste disposal techniques for hazardous and non-hazardous materials. • Identify water conservation methods used in construction activities. • Explain the impact of poor environmental practices on health and safety. • Describe the correct procedures for handling and using construction tools safely. • List the common hand tools and power tools used in interior finishing work. • Explain the risks associated with improper use of construction equipment. • Describe safety precautions to follow while using hand tools and power tools. • Discuss the importance of regular maintenance and inspection of tools to prevent accidents.	• Demonstrate the correct way to prevent spills of construction materials and chemicals. • Show how to properly segregate biodegradable and non-biodegradable waste for recycling and disposal. • Demonstrate water conservation practices while performing construction activities. • Show how to follow energy-saving protocols at a construction site. • Identify emergency alarms and evacuation routes at a construction site. • Demonstrate the correct use of firefighting equipment, such as fire extinguishers and sand buckets. • Show how to assist in basic first aid procedures for minor injuries. • Demonstrate the correct method for performing CPR in an emergency.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
First aid kits, gloves, fire extinguishers (ABC, CO_2, foam), sand buckets, fire blankets, emergency alarm systems, evacuation maps, color-coded waste bins, spill control kits, dust suppression tools such as water sprayers and dust nets, hand tools ,power tools	

Module 6: Employability Skills (30 Hours)

Mapped to DGT/VSQ/N0101, v1.0

Duration (in hours): 30:00

Key Learning Outcomes

After completing this programme, participants will be able to:

Introduction to Employability Skills:

1. Discuss the Employability Skills required for jobs in various industries.
2. List different learning and employability-related GOI and private portals and their usage.

Constitutional values - Citizenship:

3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen.
4. Show how to practice different environmentally sustainable practices.

Becoming a Professional in the 21st Century:

5. Discuss the importance of relevant 21st-century skills.
6. Exhibit 21st-century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
7. Elucidate the appropriate code of conduct.

Basic English Skills:

8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone.
9. Read and interpret text written in basic English.
10. Write a short note/paragraph / letter/e -mail using basic English.

Career Development & Goal Setting:

11. Discuss the difference between job and career.
12. Create a career development plan with well-defined short- and long-term goals.

Communication Skills:

13. Elucidate the importance of communication and professional communication.
14. Explain the importance of following verbal and non-verbal communication etiquette in various settings.
15. Elucidate the process of interacting with reporting superiors regarding job order, work output requirements, targets, performance indicators and incentives.
16. Discuss how effective coordination ensures the timely completion of tasks in accordance with quality standards.
17. Describe the steps involved in ensuring the timely resolution of problems, complaints and delays through coordination with relevant personnel and superiors.
18. Determine the role of active communication and respect in achieving a smooth workflow and resolving work standards and quality-related concerns with personnel and superiors.
19. Explain the significance of maintaining appropriate documentation concerning completed work schedules as per organizational requirements.
20. Elucidate the importance of prioritizing teamwork and supporting team members in achieving shared goals.

Diversity & Inclusion:

21. Describe the recommended practices for preventing sexual harassment, physical and verbal abuse and the objectification of women in the workplace.
22. Discuss the appropriate safety precautions to follow while utilizing transportation facilities and during night trips, particularly concerning women's safety.
23. Elucidate the process for escalating issues related to abuse and sexual harassment in the workplace according to the POSH Act and organizational procedures.
24. Determine how to effectively educate co-workers on women's rights and the importance of showing respect to all genders, including persons with disabilities.

Financial and Legal Literacy:

25. Outline the importance of selecting the right financial institution, product and service.
26. Overview how to carry out offline and online financial transactions, safely and securely.
27. List the common components of salary and compute income, expenditure, taxes, investments etc.
28. Discuss the legal rights, laws and aids.
29. Elucidate the purchase, inspection, indenting and recordkeeping procedure for stores.

Essential Digital Skills:

30. Describe the role of digital technology in today's life.
31. Overview how to operate digital devices and use the associated applications and features, safely and securely.
32. Discuss the significance of displaying responsible online behaviour while browsing, using various social media platforms, e-mails, etc., safely and securely.
33. Create sample word documents, excel sheets and presentations using basic features.
34. utilize virtual collaboration tools to work effectively.

Entrepreneurship:

35. Explain the types of entrepreneurships and enterprises.
36. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan.
37. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement.
38. Create a sample business plan, for the selected business opportunity.
39. Describe the best practices for leading teams.
40. Explain the 5S Standards and their implementation for organize the workplace and create a productive work environment.
41. Explain how to manage clients, contractors, subordinates and labourers.

Customer Service:

42. Explain the importance of implementing appropriate hygiene, grooming standards and professional dress code at work to cater to different types of customers.
43. Elucidate the significance of practicing and encouraging active listening for effective communication with both customers and co-workers.
44. Discuss the methods used to ensure effective probing of customers to identify their needs and expectations.
45. Describe the strategies for maintaining effective communication with customers, keeping them informed regarding any issues and developments involving them.
46. Determine the steps involved in identifying and addressing customer dissatisfaction and complaints promptly and effectively.
47. Explain the importance of being fair and firm with staff to achieve work objectives and describe leave and attendance management.
48. Explain the importance of upskilling self and staff for continuous improvement.

Getting Ready for apprenticeship & Jobs:

49. Create a professional Curriculum Vitae (CV)
50. Use various offline and online job search sources such as employment exchanges, recruitment agencies and job portals respectively.
51. Discuss the significance of maintaining hygiene and confidence during an interview.
52. Elucidate how to give a personal introduction and present oneself.
53. Perform a mock interview.
54. List the steps for searching and registering for apprenticeship opportunities.

Module 7: Basic Mechanical Systems Assembly and Installation

Mapped to ICE/CON/N1517, v1.0

Terminal Outcomes:

- Explain the functions and components of basic mechanical systems.
- Demonstrate the assembly and installation of mechanical system components.

Duration: 15:00	**Duration: 25:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the basic principles of mechanical systems and their role in MEP installations. • Describe the key components of mechanical systems, including pipes, valves, pumps and fittings. • List different types of mechanical fasteners such as bolts, screws and anchors used in mechanical assembly. • Explain the importance of selecting appropriate tools and materials for mechanical system assembly and installation. • Describe the step-by-step process of assembling mechanical components, including alignment and fastening techniques. • Discuss the safety procedures and best practices for handling mechanical tools and equipment. • Explain the significance of accurate measurements and alignment in mechanical installations. • Describe the common challenges encountered during mechanical assembly and how to troubleshoot them. • List the industry standards and regulations governing mechanical system installations. • Identify the appropriate personal protective equipment (PPE) required for mechanical assembly tasks.	• Show how to identify and select appropriate mechanical tools for assembly and installation. • Demonstrate the correct use of hand tools such as wrenches, pliers and screwdrivers for mechanical tasks. • Show how to read and interpret mechanical system drawings for assembly and installation. • Demonstrate the process of fastening mechanical components using bolts, screws and clamps. • Show how to measure, mark and align mechanical components before installation. • Demonstrate how to assemble and secure pipes, valves and fittings in mechanical systems. • Show the correct technique for using power tools, such as drills and grinders, safely. • Demonstrate how to inspect assembled mechanical systems for proper alignment and secure fastening. • Show how to apply safety procedures while handling mechanical components and tools. • Demonstrate the process of reporting and troubleshooting mechanical assembly issues.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Pipe wrenches, spanners, adjustable pliers, torque wrenches, pipe cutters, threading machines, deburring tools and tube benders.	

Module 8: Fundamentals of Ducting and Ventilation Installations

Mapped to ICE/CON/N1517, v1.0

Terminal Outcomes:

- Describe the different types of ducting and ventilation systems.
- Demonstrate the installation of ducting and ventilation components.

Duration: 15:00	**Duration: 25:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the purpose and importance of ducting and ventilation systems in HVAC applications. • Define different types of ducts, such as flexible, rigid and sheet metal ducts and their applications. • List key components of a ventilation system, including fans, dampers, filters and duct fittings. • Explain the principles of airflow, pressure balance and insulation in maintaining system efficiency. • Discuss the impact of poor ventilation on indoor air quality and occupant health. • Identify common duct materials and their suitability for various HVAC applications. • Explain safety precautions for handling ducting materials and tools in installation processes. • List industry standards and regulations governing ducting and ventilation installations. • Describe common ventilation system issues such as leaks, blockages and improper airflow. • Explain the importance of regular inspection and maintenance to ensure system performance and compliance. • Explain the basic principles of ducting and ventilation systems in HVAC applications. • Describe the different types of ducts, such as flexible, rigid and sheet metal ducts. • List the key components of a ventilation system, including fans, dampers and filters. • Explain the importance of proper airflow, pressure balance and insulation in ventilation installations. • Describe the standard procedures for duct fabrication, joining and installation.	• Show how to identify and select the correct tools for ducting and ventilation installation. • Demonstrate how to measure, cut and shape ducting materials accurately. • Show the correct technique for assembling and securing duct joints using fasteners and adhesives. • Demonstrate how to install and align duct sections according to layout drawings. • Show how to mount ventilation components such as fans and dampers in HVAC systems. • Demonstrate the application of sealing methods to prevent air leaks in ductwork. • Show how to test airflow and balance ventilation systems using basic measuring tools. • Show how to inspect ducting installations for compliance with industry standards. • Demonstrate the troubleshooting process for common ventilation system faults

• Discuss the impact of poor ventilation on indoor air quality and system efficiency. • Identify the different types of duct materials and their applications in HVAC systems. • Explain the safety precautions necessary for working with ducting materials and tools. • List the industry regulations and standards governing ventilation system installations. • Describe the troubleshooting techniques for common ventilation system issues such as leaks and blockages.	
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Duct cutters, tin snips, crimpers, duct sealants, air velocity meters, manometers, anemometers and sheet metal folding tools.	

Module 9: Mechanical Maintenance and Equipment Installation

Mapped to ICE/CON/N1518, v1.0

Terminal Outcomes:

- Explain the importance of regular maintenance of mechanical systems.
- Demonstrate procedures for inspecting, repairing and replacing mechanical components.

Duration: 15:00	**Duration: 25:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the basics of mechanical systems maintenance. • Describe the functions and components of pumps and motors, including impellers and bearings. • Identify the tools and equipment used for mechanical maintenance and installation. • Discuss the methods of aligning and mounting pumps and motors. • Explain the importance of lubrication and cleaning in mechanical maintenance. • List standard procedures for inspecting mechanical systems for damage or wear. • Describe common system anomalies such as unusual noise, vibration or leaks. • Elucidate the safety precautions for handling pumps, motors and other mechanical components.	• Show how to conduct a visual inspection of mechanical systems for leaks, damage or wear. • Demonstrate the process of cleaning components such as filters, grilles and duct surfaces. • Show how to replace basic components like air filters, belts and fasteners. • Demonstrate the correct method of lubricating mechanical parts. • Show how to assist in maintaining maintenance logs and documenting findings. • Demonstrate the process of preparing an installation site for pumps and motors. • Show how to assist in positioning and aligning pumps and motors using appropriate tools. • Demonstrate how to secure pumps and motors to their foundations or mounts. • Show how to check for leaks or misalignments after installation and report them
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Smart sensors, actuators, controllers, HVAC automation kits, diagnostic tools, software for BMS integration, IoT-enabled monitoring devices, calibration kits, energy management software, safety testing equipment and personal protective equipment (PPE).	

Module 10: Mechanical System Start-Up and Shutdown

Mapped to ICE/CON/N1518, v1.0

Terminal Outcomes:

- Explain the steps involved in starting up and shutting down mechanical systems.
- Demonstrate the procedures for system monitoring and troubleshooting.

Duration: 15:00	**Duration: 25:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the procedures for starting up and shutting down mechanical systems. • Describe the parameters to monitor during system operations, such as pressure and flow rates. • List the safety protocols to be followed during system start-up and shutdown. • Discuss the common issues encountered during system operations and troubleshooting methods. • Explain the importance of proper documentation and reporting in mechanical system operations. • Describe the techniques for identifying system anomalies such as irregular noise, vibration or system errors.	• Show how to verify system connections before start-up. • Demonstrate the correct safety procedures to follow during system start-up. • Show how to record system parameters such as pressure, temperature and flow rates. • Demonstrate how to report anomalies like unusual noise, vibration or system errors. • Show the step-by-step process for shutting down a mechanical system safely. • Demonstrate the correct procedure for cleaning and storing tools and materials after completing tasks. • Show how to assist in preparing handover documentation or maintenance reports.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Pressure gauges, temperature sensors, flow meters, wrenches, multimeters and diagnostic tools for troubleshooting mechanical systems.	

Module 11: Electrical Wiring and LV Installations

Mapped to ICE/CON/N1519, v1.0

Terminal Outcomes:

- Explain the principles of electrical wiring and low-voltage (LV) installations.
- Demonstrate the proper wiring techniques and installation procedures.

Duration: 10:00	**Duration: 15:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the types of electrical systems used at construction sites. • Describe the components of electrical systems, including wires, conduits and junction boxes. • Explain the basics of low-voltage electrical wiring systems. • Identify wiring standards, including color coding and labeling conventions. • List the common tools used for electrical wiring, such as wire strippers, cutters and crimping tools. • Explain the handling and maintenance of tools and equipment used in electrical work. • Describe the properties of different wires, conduits and fittings. • Discuss the use of personal protective equipment (PPE) in electrical tasks. • Explain the hazards associated with electrical wiring and the methods to mitigate risks.	• Show how to interpret basic site layout plans and identify wiring requirements. • Demonstrate how to organize and prepare tools, equipment and PPE for electrical wiring tasks. • Show how to check the quality of wires, conduits and connectors before use. • Demonstrate the process of cleaning and preparing work areas for safe wiring operations. • Show how to assist in laying conduits and routing cables as per supervisor instructions. • Demonstrate the correct method of passing electrical wires through conduits. • Show how to hold or position cables, trays and fixtures during installation. • Demonstrate the process of fixing wiring to junction boxes, panels and outlets. • Show how to follow standard color codes and markings for wire identification. • Demonstrate how to secure and bundle cables for safety and organization. • Show how to assist in wiring connections for lighting, appliances and switches.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Wire strippers, cable cutters, crimping tools, electrical screwdrivers, voltage testers, conduit benders, electrical tapes and circuit breaker testers.	

Module 12: Earthing System Installation and Electrical Testing

Mapped to ICE/CON/N1519, v1.0

Terminal Outcomes:

- Describe the purpose and importance of earthing systems.
- Demonstrate procedures for earthing system installation and electrical testing.

Duration: 10:00	**Duration: 20:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the importance of grounding and earthing in electrical installations. • Describe the principles of earthing, including different types such as plate earthing and rod earthing. • Identify the components of an earthing system and their functions. • Explain the steps involved in assisting with electrical installations. • Describe the techniques for organizing and routing cables efficiently. • Explain the procedures for conducting basic insulation checks. • Discuss the safety procedures to follow while handling live wires and connecting electrical panels. • List the common issues in electrical systems and their potential solutions.	• Show how to assist in digging pits and laying earthing electrodes as per site specifications. • Demonstrate how to connect earthing conductors to grounding rods, plates or mesh. • Show how to check the placement of earthing components to ensure minimal resistance. • Demonstrate the process of checking earthing continuity and effectiveness under supervision. • Show how to conduct basic insulation checks using tools like a multimeter. • Demonstrate the correct safety procedures for handling live wires. • Show how to report any damaged wires, tools or components to the supervisor immediately.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Earth resistance testers, grounding rods, clamp meters, megohmmeters (insulation resistance testers), continuity testers and protective gloves.	

Module 13: Post-Installation Electrical Tasks

Mapped to ICE/CON/N1519, v1.0

Terminal Outcomes:

- Explain the final inspection and testing procedures after electrical installations.
- Demonstrate proper documentation and compliance checks post-installation.

Duration: 10:00	**Duration: 15:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the importance of labelling and documenting wiring connections. • Describe the standard procedures for cleaning up a work area after installation. • List the proper methods for storing unused wiring and equipment. • Explain the importance of following disposal procedures for electrical waste.	• Show how to assist in labelling and documenting wiring connections. • Demonstrate the process of cleaning up the work area and disposing of waste materials in designated areas. • Show how to properly store unused wiring and equipment in the appropriate storage areas.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Wire tracers, multimeters, electrical load testers, thermal imaging cameras and power quality analyzers.	

Module 14: Preparing and Installing Temporary Electrical Systems

Mapped to ICE/CON/N1520, v1.0

Terminal Outcomes:

- Explain the requirements for setting up temporary electrical systems.
- Demonstrate the safe installation and connection of temporary electrical components.

Duration: 10:00	**Duration: 15:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the purpose and components of temporary lighting systems. • Describe the use of low-voltage electrical panels in construction setups. • Explain the importance of grounding and load balancing in temporary electrical setups. • Identify the tools used for installing temporary lighting and electrical panels. • Describe the procedures for installing temporary lighting and electrical panels. • Explain safety hazards associated with temporary installations and the necessary precautions.	• Demonstrate how to assess site requirements for temporary electrical setups under supervisor guidance. • Show how to identify and arrange tools and equipment for temporary lighting and panel installations. • Demonstrate how to inspect lighting fixtures, cables and panels for functionality before installation. • Show how to assist in laying cables for temporary lighting and power arrangements. • Demonstrate how to position and hold fixtures, lights and panels during installation. • Show how to assist in connecting temporary electrical panels to power sources like generators. • Demonstrate how to route and secure cables to avoid tripping hazards or damage. • Show how to assist in installing temporary lighting systems for pathways, work areas and emergency lighting. • Demonstrate how to ensure proper grounding of temporary setups as instructed. • Show how to follow supervisor instructions to balance power loads on temporary electrical panels.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Extension reels, distribution boards, temporary power cables, weatherproof sockets, industrial plugs and cable management accessories.	

Module 15: Maintaining Temporary Electrical Systems

Mapped to ICE/CON/N1520, v1.0

Terminal Outcomes:

- Explain the maintenance procedures for temporary electrical systems.
- Demonstrate fault detection and troubleshooting in temporary setups.

Duration: 10:00	**Duration: 20:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain common issues in temporary electrical setups and their troubleshooting methods. • Describe techniques for testing electrical systems using basic tools. • Explain the importance of isolating circuits before maintenance. • Identify safety protocols for handling live circuits during maintenance. • Describe the procedures for maintaining and repairing temporary electrical setups.	• Demonstrate how to perform visual inspections of temporary lighting and power setups for damage. • Show how to replace bulbs, switches and sockets, as instructed. • Demonstrate how to check cables and connectors for wear and tear and report issues to the supervisor. • Show how to assist in performing basic electrical tests like voltage and current checks. • Demonstrate how to isolate circuits safely before starting any maintenance tasks.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Test lamps, voltage detectors, insulation testers, maintenance logs and portable generator maintenance kits.	

Module 16: Post-Installation and Maintenance Activities

Mapped to ICE/CON/N1520, v1.0

Terminal Outcomes:

- Describe post-installation inspection and maintenance procedures.
- Demonstrate how to identify and rectify defects in MEP systems.

Duration: 10:00	**Duration: 20:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the procedures for dismantling temporary electrical setups. • Describe the importance of proper storage of electrical components and tools. • Explain the process of documenting maintenance tasks and reported issues.	• Demonstrate how to assist in disassembling temporary electrical setups once the work is completed. • Show how to store cables, tools and components in designated storage areas after use. • Demonstrate how to document maintenance tasks and reported issues for future reference.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Cable fault locators, infrared thermometers, insulation testers, clamp meters and voltage stabilizers.	

Module 17: Traditional Plumbing System Installation

Mapped to ICE/CON/N1521, v1.0

Terminal Outcomes:

- Describe the process and key components of traditional plumbing installations.
- Demonstrate the installation of pipes, fixtures and fittings as per standard procedures.

Duration: 15:00	**Duration: 25:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the basics of plumbing systems, including water supply and drainage. • Describe the characteristics and applications of pipes, fixtures and fittings. • Explain different types of joints and seals used in plumbing. • Identify the basic hand and power tools used in plumbing installations. • Explain common testing methods for plumbing systems. • Describe safety hazards associated with plumbing work and the necessary safety measures.	• Demonstrate how to unpack and inspect pipes, fittings and fixtures as per safety and manufacturer guidelines. • Show how to check the availability and specifications of materials, tools and equipment. • Demonstrate how to identify missing or defective items and report them promptly. • Show how to clean and organize the work area, ensuring tools and equipment are positioned for ease of access. • Demonstrate how to use basic hand and power tools for cutting, bending and shaping pipes. • Show how to assist in measuring and marking installation points. • Demonstrate how to hold and position pipes and fixtures during installation. • Show how to apply basic jointing techniques, such as threading, gluing and sealing under supervision. • Demonstrate how to secure installed fixtures and pipes using clamps and fasteners. • Show how to assist in testing plumbing systems for leaks and other issues as instructed. • Demonstrate how to ensure proper insulation and alignment of pipes during installation.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Pipe wrenches, pipe cutters, hacksaws, tube benders, soldering kits, threading dies, adjustable spanners and pipe reamers.	

Module 18: IoT-Based Water Management Systems Installation

Mapped to ICE/CON/N1521, v1.0

Terminal Outcomes:

- Explain the concept and benefits of IoT-based water management systems.
- Demonstrate the installation and integration of IoT-enabled plumbing components.

Duration: 15:00	**Duration: 25:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the functionality and components of IoT-enabled water management systems. • Describe how IoT-based water management systems integrate with traditional plumbing. • Identify the role of sensors and controllers in smart water systems. • Explain the importance of connectivity and data monitoring in IoT-based plumbing systems. • Describe potential troubleshooting methods for IoT-enabled plumbing setups.	• Demonstrate how to unpack, inspect and assemble IoT-enabled components as per guidelines. • Show how to assist in setting up sensors and controllers for smart water systems. • Demonstrate how to follow basic instructions to connect IoT devices with the main plumbing system. • Show how to test the functionality of IoT devices with assistance. • Demonstrate how to record and report any issues or irregularities in the IoT system.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Digital multimeters, IoT sensors, smart water meters, Wi-Fi routers, data loggers, microcontrollers (Arduino/Raspberry Pi) and water flow sensors.	

Module 19: Repairing and Maintaining Plumbing Systems

Mapped to ICE/CON/N1522, v1.0

Terminal Outcomes:

- Explain common plumbing system failures and their causes.
- Demonstrate repair and maintenance techniques for plumbing systems.

Duration: 15:00	**Duration: 25:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the common causes of plumbing system failures. • Describe the techniques for leak detection and repair. • Explain the methods for maintaining plumbing tools and materials. • Describe the importance of following environmental and safety regulations in plumbing repair. • Explain the role of proper waste disposal and management in plumbing maintenance.	• Demonstrate how to shut off the water supply to a system under repair as instructed. • Show how to dismantle pipes, fixtures or components safely under supervision. • Demonstrate how to assist in identifying damaged or worn-out parts. • Show how to apply temporary fixes like sealing or patching leaks. • Demonstrate how to replace damaged components using the correct tools and techniques. • Show how to reassemble and secure repaired systems. • Demonstrate how to test repaired systems for proper functioning.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Leak detection kits, pressure gauges, wrenches, drain augers, pipe repair clamps, epoxy putty, pipe sealants and inspection cameras.	

Module 20: Green Plumbing and Sustainable Water Management

Mapped to ICE/CON/N1522, v1.0

Terminal Outcomes:

- Explain the importance of sustainable water management and green plumbing practices.
- Demonstrate the installation of eco-friendly plumbing solutions, such as low-flow fixtures and greywater systems.

Duration: 15:00	**Duration: 25:00**
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the importance of sustainable waste management in plumbing. • Describe the basic principles of water purification and filtration. • Explain green plumbing practices, including water conservation techniques. • Identify types of eco-friendly plumbing fixtures and their benefits. • Describe methods for installing and maintaining greywater recycling systems.	• Demonstrate how to assist in installing basic filtration systems for water purification. • Show how to record and report water quality issues as observed. • Demonstrate how to assist in installing and maintaining greywater recycling systems. • Show how to collect and segregate plumbing waste for proper disposal. • Demonstrate how to assist in installing low-flow fixtures and water-saving devices. • Show how to apply basic insulation to pipes to reduce energy usage. • Demonstrate how to follow basic water conservation practices, such as repairing leaks to minimize water wastage.
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
Low-flow fixture kits, rainwater harvesting filters, greywater recycling units, pipe insulation materials, water quality testing kits and solar water heating components.	

On-the-Job Training

Mapped to MEP Executive, v 1.0

All the On-the-Job Training Program must be conducted only at On-Site of relevant Industry. The details mentioned below are NOS wise Terminal Outcomes of OJT Period.

ICE/CON/N1523	**Identify Tools, Equipment and Materials Relevant to MEP Work at a Construction Site**
Mandatory OJT duration (in Hours)	**10:00**
Terminal Outcomes:	
During the OJT period, the candidate will be able to: • Identify and differentiate commonly used tools, equipment and consumables for Mechanical, Electrical and Plumbing activities at the job site. • Organise, position and arrange tools and materials at the workplace as per supervisor instructions for smooth workflow. • Inspect tools visually for damages, missing parts and improper handling and report irregularities to the supervisor. • Follow site storage practices for hand tools, power tools, testing devices and materials to prevent damage, rust or exposure. • Demonstrate safe handling of tools and materials using correct lifting posture and PPE as applicable in live site conditions.	
ICE/CON/N1524	**Read and Interpret MEP System Drawings and Specifications**
Mandatory OJT duration (in Hours)	**15:00**
Terminal Outcomes:	
During the OJT period, the candidate will be able to: • Read and correlate real-time MEP layouts, legends, scales and symbols from construction drawings to exact work locations on site. • Identify points of installation for HVAC ducting, wiring routes, earthing pits, pipe layouts, equipment mounting, drainage points etc. • Mark installation points, levels and distances using drawings, measuring tools and supervisor instructions. • Cross-verify discrepancies between drawings and actual site conditions and escalate for clarification before execution. • Document updates/redline corrections on drawings or installation checklists as guided by supervisor/engineer.	
ICE/CON/N1517	**Assist in Installation of Mechanical Systems and HVAC Ducts**
Mandatory OJT duration (in Hours)	**10:00**
Terminal Outcomes:	
During the OJT period, the candidate will be able to: • Identify installation locations for mechanical equipment, ducts and accessories based on layout marking. • Hold, align and support ducts, pipes, valves, dampers and hangers during fixing and fastening operations.	

• Assist in sealing duct joints, applying insulation and supporting duct hangers as per instruction. • Operate and handle mechanical tools safely during installation activities under supervision. • Report alignment issues, loose joints, space constraints or clashes with electrical/plumbing services to the supervisor.	
ICE/CON/N1518	**Assist in Repair, Maintenance and Testing of Mechanical Systems**
Mandatory OJT duration (in Hours)	**05:00**
Terminal Outcomes:	
During the OJT period, the candidate will be able to: • Conduct visual inspections to identify leakages, abnormal noises, vibrations and wear in running mechanical systems. • Assist in cleaning/servicing components such as filters, grilles, strainers and vents. • Support lubrication and replacement of belts, bearings, gaskets and fasteners as directed. • Record operating parameters such as pressure, temperature, vibration levels and flow during system testing. • Maintain maintenance tools, logbook entries and follow safe shutdown and handover procedures.	
ICE/CON/N1519	**Assist in Electrical wiring, LV Installations and Earthing Systems**
Mandatory OJT duration (in Hours)	**05:00**
Terminal Outcomes:	
During the OJT period, the candidate will be able to: • Assist in routing cables and wiring conduits across walls, ceilings, shafts and trenches as per drawings. • Hold and position junction boxes, DBs, conduits, panels and lighting fixtures during mounting and fastening. • Connect wires to switches, fixtures and sockets while maintaining LV colour codes and polarity under supervision. • Support earthing pit preparation and connect earthing conductors to electrodes, DBs and equipment. • Ensure safe handling of electrical tools and PPE compliance while working near live circuits.	
ICE/CON/N1520	**Assist in Installation, Repair and Maintenance of Electrical Systems**
Mandatory OJT duration (in Hours)	**10:00**
Terminal Outcomes:	
During the OJT period, the candidate will be able to: • Assist in setting up temporary and permanent electrical distribution boards and lighting circuits at sites. • Replace faulty switches, lamps, breakers, sockets, fuses and connectors as instructed. • Conduct preliminary testing using basic tools (multimeter, test lamp, continuity tester) and record readings. • Identify faults such as short circuit, overload, loose termination, burnt contacts and damaged insulation and escalate. • Follow isolation/LOTO procedures before commencing maintenance and restore systems safely after work.	

ICE/CON/N1521	**Assist in Installation of Plumbing Systems**
Mandatory OJT duration (in Hours)	**10:00**
Terminal Outcomes:	
During the OJT period, the candidate will be able to: • Identify pipeline routes for water supply, drainage and sanitary systems as per layout markings. • Support cutting, bending and positioning of GI/UPVC/CPVC/HDPE pipes during installation. • Apply sealing/jointing methods including solvent cement, Teflon tape, threading and compression fittings. • Hold and position plumbing fixtures such as wash basins, WC units, valves and fittings during installation. • Assist in leak testing and water flow trials and report abnormalities immediately.	
ICE/CON/N1522	**Assist in Repair and Maintenance of Plumbing Systems**
Mandatory OJT duration (in Hours)	**05:00**
Terminal Outcomes:	
During the OJT period, the candidate will be able to: • Identify leakage points, blockages, pressure drop and fixture malfunctions in plumbing lines. • Shut off water supply safely before dismantling plumbing components. • Assist in replacing faulty pipes, valves, seals, traps, flexible hoses and fixtures using correct tools. • Apply temporary and permanent repairs such as patching, insulation and sealing as directed. • Restore water flow and conduct post-repair inspection while maintaining safety and hygiene.	

Annexure

Trainer Requirements

Minimum Educational Qualification	Specialization	Relevant Industry Experience		Preferable Training Experience	
		Years	Specialization	Years	Specialization
Post Graduation	Civil / Electrical / Mechanical Engineering	2	Site Execution (MEP Work)	1	Site Execution (MEP Work)
OR					
Graduation	Civil / Electrical / Mechanical Engineering	4	Site Execution (MEP Work)	1	Site Execution (MEP Work)
OR					
Diploma	Civil / Electrical / Mechanical Engineering	6	Site Execution (MEP Work)	1	Site Execution (MEP Work)

Trainer Certification	
Domain Certification	**Platform Certification**
Recommended that the Trainer is certified for the Job Role: *"MEP Executive"*, mapped to the Qualification Pack: "ICE/CON/Q1501, v1.0". The minimum accepted score is 80%.	Recommended that the Trainer is certified for the Job Role: *"Trainer (VET and skills)"*, mapped to the Qualification Pack: "MEP/Q2601, v3.0". The minimum accepted score is 80%.

Assessor Requirements

Minimum Educational Qualification	Specialization	Relevant Industry Experience		Preferable Training Experience	
		Years	Specialization	Years	Specialization
Post Graduation	Civil / Electrical / Mechanical Engineering	2	Site Execution (MEP Work)	1	Site Execution (MEP Work)
OR					
Graduation	Civil / Electrical / Mechanical Engineering	4	Site Execution (MEP Work)	1	Site Execution (MEP Work)
OR					
Diploma	Civil / Electrical / Mechanical Engineering	6	Site Execution (MEP Work)	1	Site Execution (MEP Work)

Assessor Certification	
Domain Certification	**Platform Certification**
Recommended that the Assessor is certified for the Job Role: *"MEP Executive"*, mapped to the Qualification Pack: "ICE/CON/Q1501, v1.0". The minimum accepted score is 80%.	Recommended that the Assessor is certified for the Job Role: *"Assessor (VET and skills)"*, mapped to the Qualification Pack: "MEP/Q2701, v3.0". The minimum accepted score is 80%.

Assessment Strategy

This section includes the processes involved in identifying, gathering and interpreting information to evaluate the Candidate on the required competencies of the program.

1. **Assessment System Overview:**

   Assessment is done through ICES affiliated Assessment Agencies. Assessors are trained & certified by ICES after Training of Assessor (ToA) program. Assessments are conducted to gauge and assess the trainee's skill and knowledge competency in the specified areas.
   The assessment will have both theory, practical and viva components as per ratio specified in each NOS for **MEP Executive** job role.

   During the practical task, trainees are assessed on their workmanship, quality of finished product and time management. They will be graded for all their assessments based on the approved assessment strategy which is signed off by ICES. The Assessor submits an assessment plan to ICES prior to assessments.
   The assessment plan contains the following information:

   - What will be assessed, i.e. the competency based on each NOS based on theory, practical and viva questions
   - How assessment will occur i.e. methods of assessment
   - When the assessment will occur
   - Duration of assessment
   - Where the assessment will take place i.e. context of the assessment (workplace/simulation)
   - The criteria for decision making i.e. those aspects that will guide judgments
   - Where appropriate, any supplementary criteria are used to make a judgment on the level of performance.

   ICES will be monitoring thoroughly the complete Assessment process.

2. **Testing Environment:**

   - Training partner shares the batch start date and end date, number of trainees and the job role.
   - Assessment will be fixed for a day after the end date of training. It could be next day or later. Assessment will be conducted at the training venue/test center only.
   - The knowledge/theory assessments are conducted with proper seating arrangements with enough space between the candidates to prevent mal practicing.
   - Question set for Theory and Practical will be distributed to each candidate by the Assessor.
     - Theory testing will include MCQ type questions, pictorial questions etc. which will test the trainee on his theoretical knowledge of the subject.
     - Practical assessments will be conducted in the approved test centers. The training provider will ensure adequate tools and materials are available to conduct the practical test.
     - Viva Testing will be conducted during or post to the practical assessment by the assessor concerned. This Viva Assessment is applicable to understand the outcomes from OJT attended by the concerned candidate.
   - One (1) Assessor is eligible to conduct assessments of a batch of maximum 30 candidates.

   - The assessment must comprise of two components, namely:

- Knowledge assessment (Theory and Viva assessment)
- Skill assessment (Practical / Hands-on Skill assessment)

3. **Mode of assessment**
   - Demonstration/Practical Performance /Skill Assessment
   - Synoptic multiple-choice question test for Theory Assessment
   - Viva for Knowledge Assessment (Applicable to note the outcomes from OJT only)
4. **Performance/skill assessment:**
   - The performance/skill assessment will be conducted through demonstration/practical
   - For the practical test trainees are assessed through a given task, which they have to complete correctly for them to be marked as passed.
   - The assessment is conducted in a simulated working environment. Due to this fact, the assessors must note that the naturally occurring evidence of competence is unavailable or infrequent. Simulation must be undertaken in a Realistic Working Environment which provides an environment that replicates the key characteristics of the workplace in which the skill to be assessed is normally employed.
5. **Knowledge Assessment:**
   - The knowledge assessments are conducted through Theory (written) Test and Viva Test
   - Synoptic test is used for this. It is an MCQ (Multiple Choice Question) test which is prepared externally and externally marked, meaning by agency having no link with training partners.
   - The Viva test will be conducted by the assessor in the oral mode considering the communication and domain understanding of skills of trainees.
   - The assessment strategy, weightage and duration of assessment for **MEP Executive** is summarized below

Assessment Type	Formative or Summative	Strategies	Weightage	Duration (hours)
Knowledge	Summative	MCQ	30	1 hour
Knowledge	Summative	Viva	10	1 hour
Skill	Summative	Structured practical Task	60	7 hours

6. **Assessment Quality Assurance levels/Framework**
   - ICES has developed assessment criteria framework for each Qualification pack as per National Occupational Standards. The criteria framework includes weightages/marks for each criterion under knowledge and skill. The criteria ensure quality assurance as they ensure valid, consistent and fair assessments at all locations. Issued to the affiliated Assessment body. The Assessment Body develops questions based on ICES's approved assessment criteria.
   - The training partner will intimate the time of arrival of the assessor and time of leaving the venue. Random spot checks/audit may be conducted by ICES to monitor assessment.
   - Continuous Monitoring through virtual and In-person mode are conducted to ensure the assessment is conducted as per stipulated process
   - Process and Technical audit of assessment batches by quality team are conducted to avoid errors in assessment process
   - A well -defined comprehensive framework of NON-COMPLIANCE MATRIX is defined and implemented to identify the non-compliance made by assessor and AA and punitive actions are taken correspondingly.
   - The capacity building sessions are conducted regularly for assessors and assessment agencies to update them about best practices in assessment

7. **Types of evidence or evidence-gathering protocol:**

- Evidence in the form of answer sheets in case of knowledge assessments (Theory only) is collected.
- For Practical and Viva assessments videos and photographs are prepared as evidence. These are submitted by the assessor to the assessment agency. ICES does random checks of the same with the participant/ trainee's ID and ascertains authenticity and validity of assessments.
- Post Assessment, the evidence are uploaded by Assessor to assessment agency and further assessment agency to ICES as per stipulated TAT
- Evidence are broadly photographic and video graphics in nature (Geo-Tagged)
- Results along with evidence to be submitted to ICES by the concerning Assessment Agency in the prescribed format and on Digital Format and Physical Format (As required)
- Results to be uploaded on SIDH and other relevant portals for collective data management.

8. Method of verification or validation:

- The process and technical audit of assessment batches are done by Awarding Body
- Attendance of each candidate is verified and it is ensured that only those candidates are assessed by assessors who are meeting the stipulated minimum percentage of attendance
- The result of each candidate is verified; it is verified that that result on SIP is matched with respect to summary sheet submitted by AAs
- Under detailed technical audit for sample batches, the knowledge and skill assessment results for each candidate are checked in technical aspect.
- All the evidence of batches are preserved on server of Awarding Body digital platform

9. On the Job:

- On job training (OJT), candidates undergo training and leaning at actual workplace for a fixed period of time and a certain weightage of assessment is allocated out of total skill weightage of Qualification Pack for undergoing OJT as stipulated by ICES. This OJT score and assessors' end point score are combined to arrive at final Marking/grading of trainees' skill test. The OJT score is determined by Supervisor / Engineer / other authorized head of departments of relevant industry under which candidates undergo on job training.
- The Assessment is subject to take place only after submission of OJT data (in case of STT only) approved by concerned industry and training provider.
- The Hard copy of the OJT report (on trainings, outcomes, exposures learnt and feedback certified by Supervisor / Engineer / other authorized head of departments of relevant industry) will be submitted to the Assessor by the concerned candidate on the Assessment date only, failing which the candidate may not be allowed for attending the Assessment.
- As OJT is mandatory for this QP, the TP should ensure the correct submission of all relevant reports pertaining to OJT of each trained candidate. The Assessment agency is responsible for collecting all the relevant information and submit the same to ICES in future (if required).

References

Glossary

Term	Description
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.
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 Abbreviations

Acronym	Description
NOS	National Occupational Standard(s)
NSQF	National Skills Qualification Framework
QP	Qualification Pack
TVET	Technical and Vocational Education and Training
MSDE	Ministry of Skill Development and Entrepreneurship
NCVET	National Council for Vocational Education and Training
NSDC	National Skill Development Corporation
ICES	Integrated Council for Entrepreneurship and Skilling (erstwhile The Institution of Civil Engineers Society)
AB	Awarding Body
AA	Assessment Agency
TP	Training Partner
TC	Training Centre
ITI	Industrial Training Institute
ISCO	International Standard Classification of Occupations
NCO	National Classification of Occupations
NCrF	National Credit Framework
NEP	New Education Policy
Q-File	Qualification File
MC	Model Curriculum
PC	Performance Criteria
KU	Knowledge and Understanding
GS	Generic Skills
PMKVY	Pradhan Mantri Kaushal Vikas Yojana
DDUGKY	Deen Dayal Upadhyaya Grameen Kaushalya Yojana
STT	Short Term Training
RPL	Recognition of Prior Learning
NAPS	National Apprenticeship Promotion Scheme
NQR	National Qualification Register
OJT	On the Job Training
NSQC	National Skill Qualification Committee
IS	Indian Standard
AHU	Air Handling Unit
FCU	Fan Coil Unit
VFD	Variable Frequency Drive
VRF / VRV	Variable Refrigerant Flow / Variable Refrigerant Volume

CFM	Cubic Feet per Minute
BTU	British Thermal Unit
RH	Relative Humidity
DBT	Dry Bulb Temperature
WBT	Wet Bulb Temperature
COP	Coefficient of Performance
TR	Tonnage of Refrigeration
GI	Galvanized Iron
MS	Mild Steel
AC	Alternating Current
DC	Direct Current
DB	Distribution Board
MCB	Miniature Circuit Breaker
RCCB	Residual Current Circuit Breaker
ELCB	Earth Leakage Circuit Breaker
MCCB	Molded Case Circuit Breaker
RCD	Residual-Current Device
LUX	Illuminance Unit
LED	Light Emitting Diode
SPD	Surge Protection Device
IR Test	Insulation Resistance Test
V/A/W	Volt / Ampere / Watt
LV	Low Voltage
HV	High Voltage
UPS	Uninterruptible Power Supply
PV	Photovoltaic
MPPT	Maximum Power Point Tracking
PWM	Pulse Width Modulation
kWp	Kilowatt Peak
SPV	Solar Photovoltaic
SoC	State of Charge
BMS (Battery)	Battery Management System
BOS	Balance of System
CPVC	Chlorinated Polyvinyl Chloride
UPVC	Unplasticised Polyvinyl Chloride
HDPE	High-Density Polyethylene
GI Pipe	Galvanized Iron Pipe
PRV	Pressure Reducing Valve
NRV	Non-Return Valve

WC	Water Closet
GWT	Grey Water Treatment
WWTP	Waste Water Treatment Plant
RO	Reverse Osmosis
TDS	Total Dissolved Solids
pH	Potential of Hydrogen
IR Thermography	Infrared Thermography
LUX Meter	Light Intensity Meter
V/A Meter	Volt/Ampere Meter
PPE	Personal Protective Equipment
LOTO	Lock-Out Tag-Out
NDT	Non-Destructive Testing
FID	Fault Identification & Diagnostics
PPE	Personal Protective Equipment
MSDS	Material Safety Data Sheet
SDS	Safety Data Sheet
IEC	International Electrotechnical Commission
IS	Indian Standard
BIS	Bureau of Indian Standards
OSHA	Occupational Safety & Health Administration
EHS	Environment, Health & Safety
ICT	Information and Communication Technology
CV	Curriculum Vitae
SWOT	Strengths, Weaknesses, Opportunities, Threats
MIS	Management Information System
KPI	Key Performance Indicator