INSTALL MECHATRONIC SYSTEMS

UNIT CODE: ENG/OS/MC/CR/02/6/A

Unit description

This unit covers the competencies required to install mechatronic systems. It involves competencies to install system wiring, install electrical devices install piping system, install mechanical system, install electronics equipment system, install sensing devices in system, integrate mechatronic system in system and test and Commission mechatronic system

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function.	**PERFORMANCE CRITERIA** These are assessable statements which specify the required level of performance for each of the elements. ***Bold and italicized terms are elaborated in the Range.***
1. Install system wiring	1.1 Circuit diagram is designed according to engineering and user specifications 1.2 ***Wiring Materials*** are identified according to the circuit diagram specifications 1.3 ***Tools and equipment*** are identified according to the job requirement 1.4 Wiring materials are laid out according to the circuit diagram 1.5 ***Mechanical units of wiring*** are installed according to prescribed method of installation 1.6 Electrical system is installed according to circuit diagrams design and user requirement 1.7 Electrical wiring is tested and commissioned for desired operation according design specifications
2. Install electrical devices	2.1 Installation manuals are obtained for system installation according to SOPs 2.2 Work permit is obtained for commencement of system installation according to organization policy 2.3 Individual ***electrical equipment parts*** in the mechatronic system are tested according the prescribed functionality 2.4 Electrical equipment is installed in the Mechatronic system according to the required method of equipment induction 2.5 Documentation of test results is done according to system requirement

3. Install piping system	3.1 Piping diagram is designed according to user specifications 3.2 Piping materials are inspected according to specifications 3.3 ***Piping tools and equipment*** are identified according to the system requirement 3.4 Piping system is installed for mechatronic system according to user specifications 3.5 Piping system is inspected and tested according to system functionality
4. Install mechanical system	4.1 Floor level is checked according to the system specifications 4.2 Working diagram is developed according user specifications 4.3 Foundations of the mechanical equipment structure is laid according to working diagram 4.4 Mechanical equipment and structure is identified and inducted according to system specification 4.5 Mechanical machines/equipment are installed according to the user manual 4.6 Mechanical systems are inspected, tested and commissioned according to the desired functionality
5. Install electronics equipment system	5.1 Electronic equipment in mechatronic is installed according to prescribed method of operation 5.2 A.C and D.C drives are installed in mechatronic systems according to installation manual 5.3 Digital displays and indicators are identified and installed according to prescribed mode of installation 5.4 Monitoring and control systems are installed according to installation manuals 5.5 Electronic equipment is tested according to system functionality
6. Install sensing devices in system	6.1 Installation manuals are obtained for system installation 6.2 Tools and equipment are identified according to job specifications 6.3 Sensors are identified according to system functionality 6.4 Sensors are installed in Mechatronic system according to recommended mode of installation 6.5 Calibration equipment in the mechatronic system are installed according to the prescribed mode of installation

	6.6 Sensors are tested according to system functionality
7. Integrate mechatronic system	7.1 Individual components of mechatronic system are inspected according to system functionality 7.2 Appropriate tools and equipment for the system assembly mechatronic system are identified 7.3 Individual components are assembled to form a mechatronic system according to functionality of the system
8. Test and Commission mechatronic system	8.1 Relevant testing tools and equipment are identified according to system manuals 8.2 Mechatronic system is tested according to system functionality specifications 8.3 Calibration of parameters is done to achieve the desired results 8.4 Documentation of the system is done according to system functionality 8.5 Commissioning of the mechatronic system is done as per the system manuals

RANGE

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

Variable	**Range**
Wiring Materials may include but is not limited to:	• Cables • Sockets • Circuit breakers • Distribution boards • Consumer units • TPN • Cut outs • Switches • Capacitor Banks • Transformers • Batteries
Tools and equipment may include but is not limited to:	• Hand tools • Power tools • Machines
Mechanical units of wiring may include but is not limited to:	• Junction boxes • Conduits

Variable	Range
	• Meter board
Electrical equipment parts may include but is not limited to:	• Sensors • Actuators
Piping tools and equipment may include but is not limited to:	• Pipe wrenches • Adjustable spanners • Masonry fit

REQUIRED KNOWLEDGE

The individual needs to demonstrate knowledge of:

- Electrical circuit design
- Mechanical structural design
- Computer Aided Design
- Mechatronic programming
- Technical report writing
- Data analysis and interpretation
- Interpretation of technical drawings
- Documentation
- Types of tools and equipment
- Properties of materials
- Electrical and mechanical machine drives
- Pipe work
- Testing and inspection
- Sensors and transducers

REQUIRED SKILLS

The individual needs to demonstrate skills in:

- Design of mechatronic systems
- Communication skills
- Problem solving
- Creativity and innovation
- Data collection and analysis
- Use of tools and equipment
- Technical presentation
- Technical drawing
- Pipe work
- Installation and fabrication

EVIDENCE GUIDE

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

1. Critical Aspects of Competency.	1.1 Installed system wiring 1.2 Installed electrical devices 1.3 Installed piping system 1.4 Installed mechanical system 1.5 Installed electronics equipment system 1.6 Installed sensing devices in system 1.7 Integrated mechatronic system in system 1.8 Tested and Commissioned mechatronic system
2. Resource Implications.	2.1 Computers 2.2 Software 2.3 Projectors 2.4 Markers 2.5 Whiteboards 2.6 Tools and equipment 2.7 Whiteboard markers
3. Methods of Assessment.	***Competency may be assessed through:*** 3.1 Practical 3.2 Observation 3.3 Questionnaire 3.4 Case studies 3.5 Written examinations 3.6 Oral presentation
4. Context of Assessment.	4.1 Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions.
5. Guidance information for assessment.	5.1 This unit may be assessed on an integrated basis with others within this occupational sector.