# CARRY OUT MECHATRONIC PROGRAMMING

**UNIT CODE: ENG/OS/MC/CR/05/6/A**

**Unit description**

This unit describes the competencies required by a technician in order to carry out mechatronic programming. It involves identifying mechatronic programming languages used in machines, developing and customizing a mechatronic program, testing and configuring a mechatronic program, interfacing a mechatronic program with system and maintain mechatronic program.

**ELEMENTS AND PERFORMANCE CRITERIA**

| ELEMENT<br>These describe the key outcomes which make up workplace function. | PERFORMANCE CRITERIA<br>These are assessable statements which specify the required level of performance for each of the elements.<br>***Bold and italicized terms are elaborated in the Range.*** |
|---|---|
| 1. Identify mechatronic programming languages used in machine | 1.1 System manual is analysed according to manufacturer specifications<br>1.2 System software and hardware interface is established according to system specifications<br>1.3 System programmable hardware in use are identified according to system specifications<br>1.4 System software requirements are identified according to programmable hardware in use |
| 2. Develop and customize a mechatronic program | 2.1 Correct software is obtained according to the system requirements<br>2.2 Flow chart of activities is developed according to the task requirements<br>2.3 ***Peripheral devices*** to be used are identified according to software operational requirements<br>2.4 Inputs and outputs of peripheral devices are verified according system manual and program flow charts<br>2.5 ***Mechatronic program*** is generated and customized according to system requirements<br>2.6 Mechatronic program is run offline according to system specifications |
| 3. Interface mechatronic program with system | 3.1 Correct wiring of peripheral devices is verified according to system manual<br>3.2 Software and hardware is installed according to system requirements<br>3.3 Peripheral devices are installed according system specifications<br>3.4 Mechatronic program is networked with the system according to system requirements |

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| | 3.5 Mechatronic program and interface is documented according to SOPs |
| 4. Test and configure mechatronic program | 4.1 Mechatronic program is configured according to peripheral device inputs and outputs requirements<br>4.2 Mechatronic program is run online and tested for errors according to system requirements<br>4.3 Mechatronic program is debugged in the event of errors according system output |
| 5. Maintain mechatronic program | 5.1 Faults are diagnosed in the mechatronic program according to system manual<br>5.2 Faults in peripheral devices are diagnosed according to system manual<br>5.3 Mechatronic program is maintained according to system specifications<br>5.4 Peripheral devices are maintained according system specifications<br>5.5 Maintenance is scheduled according to manufacturer specifications |

## 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 |
|---|---|
| Peripheral devices may include but is not limited to: | • Sensors<br>• Actuators<br>• Instruments<br>• Integrated circuits<br>• Controllers |
| Mechatronic program may include but is not limited to: | • PLC<br>• SCADA<br>• MATLAB |

## REQUIRED KNOWLEDGE

*The individual needs to demonstrate knowledge of:*

- Mechatronic software
- Networking

- Documentation
- Scheduling/planning for maintenance
- Logic
- Algorithms and data structures
- Programming languages
- Scientific methods

**REQUIRED SKILLS**

   *The individual needs to demonstrate skills in:*

- Coding
- Communication skills
- Programming languages
- Problem solving
- Data collection and analysis
- Service and repair of system components
- Fault diagnosis
- Attention to details

**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 Identified mechatronic programming languages used in the machines<br>1.2 Developed and customized mechatronic programs<br>1.3 Tested and configured mechatronic programs<br>1.4 Interfaced mechatronic programs with systems in use<br>1.5 Maintained mechatronic programs |
|---|---|
| 2. Resource Implications. | 2.1 Computers<br>2.2 Software<br>2.3 Whiteboards<br>2.4 Whiteboard markers<br>2.5 Manuals<br>2.6 Controllers (PLCs etc.) |
| 3. Methods of Assessment. | *Competency may be assessed through:*<br>3.1 Practical<br>3.2 Observation<br>3.3 Questionnaire<br>3.4 Case studies<br>3.5 Written examinations<br>3.6 Oral presentation |

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| 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. |