



Australian Government

UEEEEC0019 Develop software solutions for microcontroller-based systems

Release: 1

UEEEEC0019 Develop software solutions for microcontroller-based systems

Modification History

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Application

This unit involves the skills and knowledge required to develop software solutions for microcontroller-based systems.

It includes preparing to develop code, developing code, testing and documenting the development of code.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

UEECD0007 Apply work health and safety regulations, codes and practices in the workplace

Competency Field

Electronics and Communications

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to develop code

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

- | | |
|------------|---|
| 1.1 | Work health and safety (WHS)/occupational health and safety (OHS) requirements and workplace procedures for relevant work area are identified, obtained and applied |
| 1.2 | Extent of code development is determined from job |

	performance specifications and in consultation with relevant person/s
	1.3 Activities are planned to meet scheduled timelines in consultation with relevant person/s in accordance with workplace procedures
	1.4 Development kit and software are selected based on specified requirements and performance standard
	1.5 Strategies are implemented to ensure programming is carried out efficiently
2 Develop code	2.1 Correct syntax is applied when developing code
	2.2 Key features of the programming language used are applied to develop and test solutions
	2.3 Approaches to issues/problems are analysed to determine effective solution/s
	2.4 Quality of work is monitored against relevant performance measures in accordance with workplace procedures and relevant industry standards
3 Test and document the development of code	3.1 Testing procedures are developed to analyse code
	3.2 Problems and bugs in code are rectified to ensure specifications are met
	3.3 Reports are prepared in accordance with professional standards and presented to relevant person/s

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UEE Electrotechnology Training Package Companion Volume Implementation Guide.

Developing software solutions in

- modifying an existing microcontroller program to comply with specified operating

microcontrollers/microprocessors must include at least the following:

- parameters
- developing microcontroller software to comply with a specified function and operating parameters
- debugging code
- analogue to digital converter (ADC)
- digital to analogue converter (DAC)
- external interrupt
- pulse width modulation (PWM)
- serial communications ports

Configuring and using at least one of the internal peripherals present on the device of the following:

Unit Mapping Information

This unit replaces and is equivalent to UEENEEH115A Develop software solutions for microcontroller based systems.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>

Assessment Requirements for UEEEC0019 Develop software solutions for microcontroller-based systems

Modification History

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and include:

- applying relevant risk identification, assessment, reporting and control requirements
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including the use of risk control measures
- configuring the microcontroller to use the input/output (I/O) ports for reading digital inputs and writing to digital outputs
- configuring microcontroller timers
- configuring timers to provide different microcontroller functions
- coordinating work with relevant person/s
- implementing a program for a specific task
- implementing code to perform specific tasks.
- providing justification for solutions to problems
- providing solutions to microcontroller software problems
- uploading code to a microcontroller using the correct set-up for the architecture and using appropriate programming hardware
- using a microcontroller and attached relevant components to test and debug code
- using industry standard integrated development environment (IDE) to develop code
- using methodical problem-solving methods
- using the inbuilt functions of an IDE to simulate the functions and registers of a microcontroller in order test and debug code.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- relevant manufacturer specifications
- relevant WHS/OHS legislated requirements
- relevant workplace documentation

- relevant workplace policies and procedures
- software programming fundamentals, including:
 - addressing modes
 - arithmetic and logic instructions
 - I/O ports
 - microprocessor/microcontroller architecture
 - relevant standards, codes and regulations
 - sub-routines
 - timing loops.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in suitable workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in suitable simulated workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment (PPE) currently used in industry
- resources that reflect current industry practices in relation to developing software solutions in microcontroller-based systems
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>