



Australian Government

UEECS0012 Design embedded controller control systems

Release: 1

UEECS0012 Design embedded controller control 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 design embedded controller control systems.

It includes preparing and designing embedded systems. It also includes obtaining approval for designs.

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

Pre-requisite Unit

Not applicable

Competency Field

Computer Systems

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to design embedded systems

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) processes and workplace procedures for a given work area are identified, obtained and applied
- 1.2** WHS/OHS risk control measures and workplace procedures are followed in preparation for the work

- 1.3 Scope of the proposed embedded system development is determined from the design brief and/or in consultation with relevant person/s
 - 1.4 Design development work is planned in accordance with workplace procedures for timelines and in consultation with others involved
 - 1.5 Materials and devices/components required for work are selected on compatibility with embedded system and in accordance with project budget requirements
 - 1.6 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety
- 2 **Design and develop embedded systems**
 - 2.1 WHS/OHS risk control work measures and workplace procedures are followed
 - 2.2 Range of embedded devices and systems and compliance standards are considered and applied to the design
 - 2.3 Alternative arrangements for the design are evaluated in accordance with the design brief
 - 2.4 Safety, functional and budget considerations are in accordance with the design
 - 2.5 Prototype devices and circuits are constructed and tested in accordance with the design brief and relevant industry standards
 - 2.6 Prototype malfunctions are identified, rectified and re-tested in accordance with workplace procedures and design brief
 - 2.7 Embedded system design is documented and submitted to relevant person/s for approval
 - 2.8 Unplanned situations are identified and resolution techniques are applied in accordance with workplace procedures
- 3 **Obtain approval for embedded systems design**
 - 3.1 Embedded system design is presented to client representative and/or relevant person/s
 - 3.2 Design modifications are negotiated with relevant person/s in accordance with workplace procedures

- 3.3 Final design is documented and approval obtained from relevant person/s
- 3.4 Quality of work is monitored in accordance with workplace procedures and/or relevant industry standards

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.

Designing and developing an embedded control system must include the following:

- at least three input/output (I/O) devices and/or functions

Unit Mapping Information

This unit replaces and is equivalent to UEENEED152A Design embedded controller control 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 UEECS0012 Design embedded controller control systems

Modification History

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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 work health and safety (WHS)/occupational health and safety (OHS) requirements, including:
 - using risk control measures
- constructing and testing prototype devices and circuits
- dealing with unplanned situations in accordance with problem-solving techniques and workplace procedures
- designing and developing embedded systems
- developing alternative designs
- developing the design within safety, functional and budget requirements
- documenting and presenting design
- negotiating design alteration requests
- obtaining approval for embedded systems design
- obtaining approval for final design
- preparing to design and develop embedded systems.

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 materials, tools, equipment and testing devices and components
- relevant microprocessor assembly language and high-level language programming, including:
 - complex data types and structures
 - central processing unit (CPU) architecture
 - documentation
 - interfacing high-level languages to assembler

- interrupt service routines
- modular programming
- processor and system support
- relevant problem-solving techniques
- relevant job safety assessments or risk mitigation processes
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace instructions, policies and procedures.

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 simulated suitable 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, facilities and equipment currently used in industry
- resources that reflect current industry practices in relation to designing embedded controller 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>