



Australian Government

UEEEEC0010 Design and develop advanced digital systems

Release: 1

UEEEEC0010 Design and develop advanced digital 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 and develop digital systems.

It includes designing and developing a digital system. It also includes working safely, following design brief, interpreting device/component specifications, constructing prototype devices, applying programming techniques to programmable devices, testing developed system prototype operation, verifying compliance of the design against the final brief, and documenting design and development work.

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

Pre-requisite Unit

Not applicable.

Competency Field

Electronics and Communications

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to design and develop digital system

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 processes and procedures for a given design work area are identified and applied

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| | <p>1.2 WHS/OHS risk control measures and workplace procedures are followed in preparation for the design work</p> <p>1.3 Extent of the proposed digital system development is determined from the design brief or in consultation with appropriate person/s</p> <p>1.4 Design development work is planned to meet scheduled timelines in consultation with other person/s involved in the development work</p> <p>1.5 Materials and devices/components required for the development work are selected on compatibility of their specifications with digital system requirements and project budget constraints</p> <p>1.6 Tools, equipment and testing devices needed to carry out the development work are obtained and checked for correct operation and safety</p> |
| <p>2 Design and develop advanced digital system</p> | <p>2.1 WHS/OHS risk control work measures and workplace procedures are followed</p> <p>2.2 Digital devices and system and compliance industry standards are applied to the digital system design</p> <p>2.3 Alternative arrangements for the design are considered based on the requirements outlined in the design brief</p> <p>2.4 Safety, functional and budget considerations are incorporated in the design</p> <p>2.5 Prototype devices and circuits are constructed and tested for compliance with the design brief, industry standards and regulatory requirements</p> <p>2.6 Prototype malfunctions are rectified and retested to ensure effective operation of design</p> <p>2.7 Digital system design is documented for submission to appropriate person/s for approval</p> <p>2.8 Unplanned situations are responded to in accordance with workplace procedures in a manner that minimises risk to personnel and equipment</p> |
| <p>3 Obtain approval for the design</p> | <p>3.1 Design is presented and explained to client representative and/or relevant person/s</p> |

- 3.2 Requests for modifications to the design are negotiated with relevant person/s within the constraints of workplace policy
- 3.3 Final design is documented and approval obtained from appropriate person/s
- 3.4 Quality of work is monitored against design brief performance agreement and/or workplace procedures or 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 advanced digital system must include at least the following:

- five variables
- sequential functions
- combinatorial functions

Unit Mapping Information

This unit replaces and is equivalent to UEENEEH148A Design and develop advanced digital 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 UEEEC0010 Design and develop advanced digital 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, workplace procedures and practices, including using risk control measures
- applying sustainable energy principles and practices
- constructing and testing prototype devices and circuits in accordance with design brief and regulatory requirements
- dealing with unplanned events/situations in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
- developing outlines of alternative designs
- developing the design within the safety and functional requirements and budget limitations
- documenting and presenting design effectively
- negotiating design alteration requests successfully
- obtaining approval for final design
- verifying compliance of the design against the final brief.

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:

- analogue to digital conversion
- connection of test/measuring devices into a circuit
- current types of oscillators based on their characteristics and operation
- current memory and storage devices based on their characteristics and operation
- design of complex sequential logic circuits (as a minimum three level sequential circuits), including current techniques - equation writing, reduction and propagation delay calculation
- design techniques for combinational and sequential logic circuits (as a minimum three levels and four input circuits)
- digital system design and development requirements
- digital to analogue conversion

- programmable logic devices
- relevant manufacturer specifications
- relevant job safety assessments or risk mitigation processes and electronic safe working practices
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace 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, equipment and personal protective equipment (PPE) currently used in industry
- resources that reflect current industry practices in relation to designing and developing advanced digital systems
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

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