Australian Government

UEEIC0008 Design electronic control systems

Release: 1

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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 electronic control systems.

It includes working safely, following design brief, applying knowledge of digital and analogue devices, interpreting device specifications, constructing prototypes, using appropriate development software, applying programming techniques, testing developed system prototype operation and documenting design and development work.

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

Pre-requisite Unit

Where prerequisite pathways have been identified, all competencies in the Common Unit Group must be have been completed plus all the competencies in one (1) of the identified Pathway Unit Group(s)

Common Unit Group

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

UEECD0051 Use drawings, diagrams, schedules, standards, codes and specifications

UEEEL0019 Solve problems in direct current (d.c.) machines

UEEEL0021 Solve problems in magnetic and electromagnetic devices

UEEEL0020 Solve problems in low voltage a.c. circuits

UEEIC0020 Fault find and repair analogue circuits and components in electronic control systems

UEEIC0018 Diagnose and rectify faults in digital controls systems

and

UEECD0043 Solve problems in direct current circuits

or

UEECD0044 Solve problems in multiple path circuits

UEECD0046 Solve problems in single path circuits

Electrical Pathway Group

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UEEEL0003 Arrange circuits, control and protection for electrical installations
UEEEL0008 Evaluate and modify low voltage heating equipment and controls
UEEEL0009 Evaluate and modify low voltage lighting circuits, equipment and controls
UEEEL0010 Evaluate and modify low voltage socket outlets circuits
UEEEL0014 Isolate, test and troubleshoot low voltage electrical circuits
UEEEL0023 Terminate cables, cords and accessories for low voltage circuits
UEEEL0024 Test and connect alternating current (a.c.) rotating machines
UEEEL0025 Test and connect transformers

Instrumentation and Control Pathway Group
UEECD0045 Solve problems in multiple path extra-low voltage (ELV) a.c. circuits
UEEIC0047 Use instrumentation drawings, specifications, standards and equipment manuals
UEEIC0041 Solve problems in pressure measurement components and systems
UEEIC0038 Solve problems in density/level measurement components and systems
UEEIC0039 Solve problems in flow measurement components and systems
UEEIC0043 Solve problems in temperature measurement components and systems
UEEIC0029 Set up and adjust PID control loops
UEEIC0030 Set up and adjust advanced PID process control loops
UEEIC0048 Verify compliance and functionality of instrumentation and control installations
UEEIC0031 Set up and configure human-machine interface (HMI) and industrial networks

Competency Field

Instrumentation & Control

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Identify electronic control	**1.1** Work health and safety (WHS)/occupational health and

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system requirements		safety (OHS) processes and workplace procedures for a given work area are identified, obtained and applied
	1.2	Hazards are identified, WHS/OHS risks assessed, and control measures and workplace procedures are implemented in preparation for work
	1.3	Scope of the proposed electronic control system is determined from design brief in consultation with appropriate person/s
	1.4	Design of electronic control system development work is planned to meet scheduled timelines in consultation with person/s involved on the worksite
	1.5	Materials and devices/components required for work are determined on compatibility of their specifications with control system requirements and project budget constraints
2 Design electronic control system	**2.1**	WHS/OHS risk control work measures and workplace procedures are followed
	2.2	Digital and analogue device elements used in control systems and relevant industry standards are applied to the design specification
	2.3	Alternative design/s is considered based on the design brief
	2.4	Safety, functional and budget considerations are incorporated in the design specification
	2.5	Prototype devices and circuits are constructed, programmed and tested for compliance with design brief and regulatory requirements
	2.6	Prototype faults are rectified and retested to ensure effective operation of design
	2.7	Control system design specifications are documented for submission to appropriate person/s for approval
	2.8	Solutions to unplanned situations are implemented in accordance with workplace policy
3 Obtain approval for electronic control system	**3.1**	Control system design is presented and explained to client representative and/or relevant person/s
	3.2	Alterations to design are negotiated with relevant

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person/s within the constraints of workplace policy

3.3 Final system design is documented and approval obtained from appropriate person/s

3.4 Quality of work is monitored against performance agreement and/or workplace 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 electronic control systems must include at least the following:

- one closed loop control system based on digital and analogue elements
- one open loop control systems based on digital and analogue elements
- a combination of inputs and outputs

Unit Mapping Information

This unit replaces and is equivalent to UEENEEI123A Design electronic control systems.

Links

Companion Volume implementation guides are found in VETNet - - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6

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