

## Component Specification

### Electronics

#### NFQ Level 4

#### 4N1290

#### 1. Component Details

<b>Title</b>	Electronics
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<b>Award Class</b>	Minor
<b>Code</b>	4N1290
<b>Level</b>	4
<b>Credit Value</b>	10
<b>Purpose</b>	The purpose of this award is to equip the learner with the knowledge, skill and competence to interpret, construct and evaluate basic electronic circuits.

#### Learning Outcomes

Learners will be able to:

- 1 Identify a broad range of electronic components and their symbols
- 2 Describe the action of a broad range of electronic components when each is placed in a simple circuit
- 3 Identify the terminals of a range of components including electrolytic capacitor, transistor, junction diode and light emitting diode
- 4 Explain the functions of transducer, transformer and transistors
- 5 Explain the properties of solder
- 6 Explain the role of flux and the need for tinning in solder

- 7 Explain the operation of basic electronic circuits
- 8 Explain the difference between conductors and insulators, open and closed circuits, ohmic and non-ohmic devices, a series and a parallel circuit, and AC and DC
- 9 Describe Ohm's Law and the units of measurement and symbols for current, potential difference and resistance
- 10 Use a soldering iron to solder and desolder wires, cables and discrete components on a stripboard
- 11 Use a variety of tools to cut and strip wires and cables and attach terminals to cables
- 12 Calculate electrical power in components and circuits
- 13 Use an oscilloscope to measure AC voltage, DC voltage, frequency of signal, and mark to space ratio
- 14 Perform the appropriate operations to calculate the time constant of an RC circuit and the rms value of an AC signal
- 15 Build circuits by selecting and testing components, devising a layout, constructing circuits on a range of boards, and modifying circuits by replacing components
- 16 Modify electronic circuits by replacing components
- 17 Work safely following workplace safety procedures.

## Assessment

### General Information

Details of FET assessment requirements are set out in [Assessment Guidelines for Providers](#).

All FET assessment is criterion referenced. Successful achievement of the award is based on learners attaining the required standards of knowledge, skill or competence.

The techniques set out below are considered the optimum approach to assessment for this component. In exceptional circumstances providers may identify alternative assessment techniques through the provider's application for programme validation which are **reliable** and **valid** but which are more appropriate to their context.

Assessment of a number of components may be integrated across programmes for delivery, provided that the learning outcomes of each minor award are assessed.

Group or team work may form part of the assessment, provided each learner's achievement is separately assessed.

All providers are required to submit an assessment plan as part of their application for programme validation. Assessment Plans will include information relating to scheduling and integration of assessment. See current FET validation guidelines at [www.qqi.ie](http://www.qqi.ie).

## Assessment Techniques

In order to demonstrate that they have reached the standards of knowledge, skill and competence identified in all the learning outcomes, learners are required to complete the assessment(s) below.

The assessor is responsible for devising assessment instruments (e.g. project and assignment briefs, examination papers), assessment criteria and mark sheets, consistent with the techniques identified below and FETAC's assessment requirements.

Programme validation will require providers to map each learning outcome to its associated assessment technique. See current FET validation guidelines at [www.qqi.ie](http://www.qqi.ie).

All learning outcomes **must** be assessed and achieved

Portfolio / Collection of Work	70%
Examination - Theory	30%

## Description

### Portfolio / Collection of Work

*A portfolio or collection of work is a collection and/or selection of pieces of work produced by the learner over a period of time that demonstrates achievement of a range of learning outcomes. The collection may be self-generated or may be generated in response to a particular brief or tasks/activities devised by the assessor.*

### Examination - Theory

*An examination provides a means of assessing a learner's ability to recall and apply knowledge, skills and understanding within a set period of time and under clearly specified conditions.*

*A theory-based examination assesses the ability to recall, apply and understand specific theory and knowledge.*

<b>Recognition of Prior Learning (RPL)</b>	Learners may be assessed on the basis of their prior knowledge and experience. Providers must be specifically quality assured to assess learners by this means. To do so they must complete B10, see Provider's Quality Assurance Guidelines and be included on the Register of RPL approved providers. See RPL Guidelines at <a href="http://www.fetac.ie">www.fetac.ie</a> for further information and registration details.	
<b>Grading</b>	Pass	50% - 64%
	Merit	65% - 79%
	Distinction	80% - 100%
<b>Specific Validation Requirements</b>	There are no specific validation requirements	
<b>Supporting Documentation</b>	None	
<b>Access</b>	To access programmes leading to this award the learner should have reached the standards of knowledge, skill and competence associated with the preceding level of the National Framework of Qualifications. This may have been achieved through a formal qualification or through relevant life and work experience.	
<b>Transfer</b>	Successful completion of this component award enables the learner to transfer to programmes leading to other certificates where this component is a mandatory or an elective requirement.	

## 2. FET Award Standards

QQI award standards are determined within the National Framework of Qualifications (NFQ), <http://www.nfq-qqi.com>. QQI determines standards for the education and training awards that it makes itself and that are made by providers to whom it has delegated authority to make an award. Providers offering programmes leading to QQI awards **must** have their programme(s) validated in accordance with current validation policy (see [www.qqi.ie](http://www.qqi.ie)).

Award standards are designed to be consistent with the NFQ's award classes i.e. major, special purpose, supplemental and minor awards. They are expressed in terms of **learning outcomes** i.e. concise statements of what the learner is expected to know or be able to do in order to achieve a particular award. Learning outcomes for FET awards are contained within the associated specifications:

AWARD CLASS	STANDARDS	AWARDS
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Major Award	Certificate Specification	Certificate (Levels 1 to 5) Advanced Certificate (Level 6)
Supplemental Award	Supplemental Specification	Supplemental Certificate (Level 3 to 6)
Special Purpose	Specific Purpose Specification	Specific Purpose Certificate (Levels 3 to 6)
Minor Award	Component Specification	Component Certificate (Levels 1 to 6)

Award standards are thresholds, they describe standards of knowledge, skill or competence to be acquired, and where appropriate, demonstrated, by a learner before an award may be made.

Award standards will be reviewed from time to time as necessary. Minor changes may be made by the QQI executive outside the review cycle where necessary. Changes to standards are published on QQI's website. Providers with validated programmes and providers with delegated authority to make awards are responsible for monitoring relevant standards and making necessary responses to changes.

### 3. FET Credit

Every FET certificate and component specification includes an FET credit value (Table 1). FET credit is quantified in multiples of 5 FET credits (up to 50 hours of learner effort). Learner effort is based on the time taken by typical learners at the level of the award to achieve the learning outcomes for the award. It includes all learning time involved including: guided learning hours, self-directed learning and assessment.

**Table 1: FET Credit Values**

NFQ Level	Major Awards Credit Values	Default Credit Values Minor Awards	Other Permitted Minor Award Credit Values	Special Purpose and Supplemental Award Credit Value Ranges
1	20	5	10	
2	30	5	10	
3	60	10	5,20	>5 and <60
4	90	10	5,15,20	>5 and <90
5	120	15	5,10,30	>5 and <120
6	120	15	5,10,30	>5 and <120

### Guide to Level

Independence is the hallmark of this level. Learning outcomes at this level correspond to a growing sense of responsibility for participating in public life and shaping one's own life. The outcomes at this level would be associated with first-time entry to many occupational sectors.

Strand	Sub-strand	Nature of learning
Knowledge	Breadth	Broad range of knowledge

	Kind	Mainly concrete in reference and with some elements of abstraction or theory
Know How & Skill	Range	Demonstrate a moderate range of practical and cognitive skills and tools
	Selectivity	Select from a range of procedures and apply known solutions to a variety of predictable problems
Competence	Context	Act in familiar and unfamiliar contexts
	Role	Act with considerable amount of responsibility and autonomy
	Learning to Learn	Learn to take responsibility for own learning within a supervised environment
	Insight	Assume partial responsibility for consistency of self-understanding and behaviour

*Extract from 'Determinations for the Outline National Framework of Qualifications': NQAI*