

# 601/1661/4 - ETCAL Level 3 NVQ Diploma in Electrical and Electronic Engineering (QCF)

## 1 Introduction to the Qualification

### 1.1 Who is the qualification for?

- This qualification has been designed to cover those learners who are:
  - employed but require additional engineering competencies as part of an existing job role or to enable career progression.

### 1.2 Learner entry requirements

There are no formal entry requirements for learners undertaking this qualification. However, centres must ensure that learners have the potential and opportunity to gain the qualification successfully.

### 1.3 Age restrictions

This qualification is not approved for use by learners under the age of 16, and ETA cannot accept any registrations for learners in this age group.

### 1.4 What does the qualification cover?

- Mandatory units cover those areas which have a common approach such as organisational safety requirements, team working and using technical information
- There are 11 optional pathways, Designing Electronic Circuits, Controlling Semiconductor Manufacturing Processes, Controlling Printed Circuit and Allied Circuit Assembly, Leading Electronic Component Manufacture, Leading Printed Circuit and Allied Circuit Assembly, Leading Electronics Assembly, Testing Electronic Circuits, Manufacturing Transformers and Inductors, Manufacturing Electrical Motors and Generators, Manufacturing Electrical Control Systems Equipment and Testing Electrical Equipment offering a choice of units applicable to individual workplaces and working environments

## 2 Qualification Structure

**Learners must achieve a minimum of 90 credits to gain the qualification. 15 credits must be achieved by completing the 3 mandatory units and the remaining credits achieved by completing the unit requirements from the selected pathway.**

### Mandatory Units – all units must be completed

Ofqual code	Unit Title	Level	CV	GLH
A/601/5013	Complying with Statutory Regulations and Organisational Safety Requirements	2	5	35

Y/601/5102	Using and Interpreting Engineering Data and Documentation	2	5	25
K/601/5055	Working Efficiently and Effectively in Engineering	3	5	25

**Designing Electronic Circuits Mandatory Pathway – all 3 units must be selected.**

Ofqual code	Unit Title	Level	CV	GLH
K/504/9745	Designing Electronic Circuit Layouts using CAD Tools	3	60	126
M/504/9746	Evaluating and Recommending Circuit Design Options	3	70	154
T/504/9747	Providing Technical Guidance to Others	3	35	70

**Controlling Semiconductor Manufacturing Processes Mandatory Pathway – all 3 units must be selected.**

F/504/9749	Identifying and Following Clean Room/Clean Work Area Protocols	3	7	28
A/504/9751	Monitoring and Analysing Data from Semiconductor Processes	3	35	77
F/504/9752	Adjusting and Sustaining Semiconductor Processes	3	40	77

**Controlling Semiconductor Manufacturing Processes Optional Pathway – plus 1 more unit must be selected from the following.**

L/504/9754	Selecting and Preparing Materials and Components for Manufacturing	3	18	63
R/504/9755	Preparing Manufacturing Systems Equipment for Operations	3	18	63
T/504/9747	Providing Technical Guidance to Others	3	35	70

**Controlling Printed Circuit and Allied Circuit Assembly Mandatory Pathway – all 3 units must be selected.**

F/504/9749	Identifying and Following Clean Room/Clean Work Area Protocols	3	7	28
Y/504/9756	Monitoring and Analysing Data from Electronic Circuit Manufacturing Processes	3	35	77
H/504/9758	Adjusting and Sustaining Electronic Circuit Manufacturing Processes	3	40	77

**Controlling Printed Circuit and Allied Circuit Assembly Optional Pathway – plus 1 more unit must be selected from the following**

L/504/9754	Selecting and Preparing Materials and Components for Manufacturing	3	18	63
R/504/9755	Preparing Manufacturing Systems Equipment for Operations	3	18	63
T/504/9747	Providing Technical Guidance to Others	3	35	70
<b>Leading Electronic Component Manufacture Mandatory Pathway – both units must be selected.</b>				
T/504/9747	Providing Technical Guidance to Others	3	35	70
D/504/9760	Processing Electronic Components within the Manufacturing System	3	50	126
<b>Leading Electronic Component Manufacture Optional Pathway - plus 1 more unit must be selected from the following.</b>				
L/504/9754	Selecting and Preparing Materials and Components for Manufacturing	3	18	63
R/504/9755	Preparing Manufacturing Systems Equipment for Operations	3	18	63
R/504/9805	Checking the Compliance of Electronic Components Against the Specification	3	20	56
<b>Leading Printed Circuit and Allied Circuit Assembly Mandatory Pathway – all 3 units must be selected.</b>				
T/504/9747	Providing Technical Guidance to Others	3	35	70
F/504/9749	Identifying and Following Clean Room/Clean Work Area Protocols	3	7	28
H/504/9808	Assembling and Checking Printed and Allied Electronic Circuits	3	55	98
<b>Leading Printed Circuit and Allied Circuit Assembly Optional Pathway - plus 1 more unit must be selected from the following.</b>				
L/504/9754	Selecting and Preparing Materials and Components for Manufacturing	3	18	63
R/504/9755	Preparing Manufacturing Systems Equipment for Operations	3	18	63
<b>Leading Electronics Assembly Mandatory Pathway – both units must be selected.</b>				
T/504/9747	Providing Technical Guidance to Others	3	35	70
M/504/9813	Assembling and Wiring Electronics Assembly Systems	3	45	84
<b>Leading Printed Circuit and Allied Circuit Assembly Optional Pathway - plus 1 more unit must be selected from the following.</b>				
L/504/9754	Selecting and Preparing Materials and	3	18	63

	Components for Manufacturing			
R/504/9755	Preparing Manufacturing Systems Equipment for Operations	3	18	63
<b>Testing Electronic Circuits Mandatory Pathway – both units must be selected.</b>				
A/504/9815	Testing Post-Production Electronic Components and Systems	3	45	77
J/504/9817	Locating and Diagnosing Faults in Post-Production Electronic Components and Circuits	3	45	77
<b>Testing Electronic Circuits Optional Pathway - plus 1 more unit must be selected from the following.</b>				
J/504/9820	Preparing Facilities for Testing Electronic Components and Circuits	3	18	63
Y/504/9823	Writing Specifications for Testing Electronic Components or Circuits	3	30	70
T/504/9747	Providing Technical Guidance to Others	3	35	70
<b>Manufacturing Transformers and Inductors Optional Pathway - 2 units must be selected from the following.</b>				
H/504/9825	Assembling Large Transformer and Inductor Cores	3	55	126
M/504/9830	Winding Transformer and Inductor Coils	3	45	112
T/504/9831	Assembling Transformers and Inductors	3	48	119
F/504/9833	Fitting Small Transformer and Inductor Cores	3	30	112
<b>Manufacturing Electrical Motors and Generators Optional Pathway - 4 units must be selected from the following.</b>				
J/504/9834	Assembling Rotor and Armature Windings	3	25	56
R/504/9836	Assembling Stator Windings	3	25	56
Y/504/9837	Assembling and Fitting Commutators	3	20	42
D/504/9838	Balancing Assembled Rotors or Armatures	3	30	63
Y/504/9840	Assembling and Fitting Electrical Rotating Equipment	3	50	105
<b>Manufacturing Electrical Control Systems Equipment Mandatory Pathway - all 3 units must be selected.</b>				
D/504/9841	Mounting Electrical Components in Enclosures	3	55	133
K/504/9843	Wiring Electrical Components and Equipment in Enclosures	3	60	147
M/504/9844	Selecting and Preparing Materials and	3	18	63

	Components for Electrical Assembly			
<b>Testing Electrical Equipment Mandatory Pathway - all 3 units must be selected.</b>				
A/504/9846	Carrying Out Functional Tests on Electrical Equipment	3	50	105
J/504/9848	Locating and Diagnosing Faults in Electrical Systems and Equipment	3	50	105
L/504/9849	Checking the Compliance of Electrical Equipment	3	20	56

## 2.1 Unit requirements are available as a separate document

## 2.2 Unit Endorsement

These units are endorsed by the Sector Skills Council for Science, Engineering and Manufacturing Technologies (SEMTA).

## 3 Centre & Qualification Approval

Centres wishing to offer the qualification will need to gain ETA's approval to do so. Current ETA centres can do this via Quartz Web. For non ETA Centres to gain approval to run the qualification please provide your details via <http://quartz.etawards/quartz-system.com> and the ETA team will start the process of approval.

## 4 Resource Requirements

### 4.1 Assessors

Assessment must be carried out by competent assessors who hold, or are working towards, a current assessor qualification. They will be expected to regularly review their skills, knowledge and understanding and, where applicable, undertake continuing professional development to ensure that they are carrying out workplace assessment to the most up to date national occupational standards.

Assessors must be able to demonstrate that they have relevant and sufficient technical competence to evaluate and judge performance and knowledge evidence of this qualification, the units being taken and the associated assessment criteria. This will be demonstrated either by holding a relevant technical qualification or by proven experience in the learner's industry. The assessor's competence must, at the very least, be at the same level as that required of the learner in the assessment so that they are able to demonstrate the skills needed.

### 4.2 Internal Quality Assurance Advisors

Internal quality assurance (IQA) must be carried out by competent quality assurers who should hold or be working towards, a current internal quality assurance qualification. They will be expected to regularly review their skills, knowledge and understanding and, where applicable, undertake continuing professional development to ensure that they are carrying out workplace assessment to the most up to date national occupational standards.

Persons carrying out the role of internal quality assurance will also be expected to be fully conversant with the ETA requirements for IQA in centres. These are detailed in the centre manual.

IQAAs must be able to demonstrate that they have relevant and sufficient technical competence to understand performance and knowledge evidence of this qualification, the units being taken and the associated assessment criteria. This will be demonstrated either by holding a relevant technical qualification or by proven experience in the learner's industry. The IQAA's competence must be sufficient to recognise what constitutes acceptable performance, knowledge and understanding as required by this qualification.

### **4.3 External Quality Assurance Advisors**

ETA will appoint an appropriately qualified person to provide advice and guidance to the centre team and act as their external quality assurance advisor (EQAA).

External quality assurance (EQA) must be carried out by competent quality assurers who should hold, or be working towards, a current external quality assurance qualification. They will be expected to regularly review their skills, knowledge and understanding and where applicable undertake continuing professional development to ensure that they are carrying out workplace assessment to the most up to date national occupational standards.

EQAAs must be able to demonstrate that they have relevant and sufficient technical competence to recognise performance and knowledge evidence of this qualification as required by the units being taken and the associated assessment criteria.

### **4.4 Assessment environment**

The evidence of a learner's competence, knowledge and understanding for this qualification can only be regarded as valid, reliable, sufficient and authentic if demonstrated in a real working environment.