

GCE Subject Level Guidance for Electronics

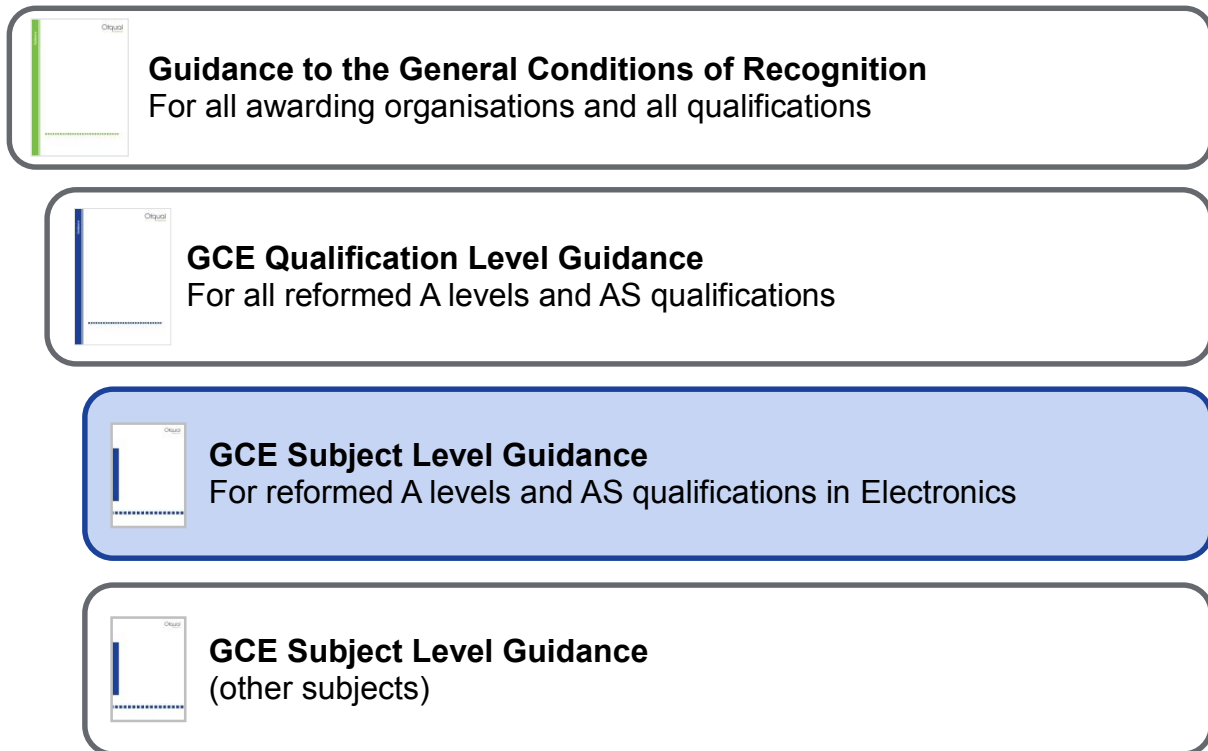
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Introduction

This document (highlighted in the figure below) is part of a suite of documents which outlines our guidance for awarding organisations offering GCE Qualifications.



This document sets out guidance which applies to the following qualifications:

- all GCE A levels in Electronics awarded on or after 1 April 2019; and
- all standalone GCE AS qualifications in Electronics awarded on or after 1 April 2018.

This guidance supports the *GCE Subject Level Conditions and Requirements for Electronics*¹.

This document constitutes guidance for the purposes of section 153 of the Apprenticeships, Skills, Children and Learning Act 2009 (the '2009 Act') and Condition GCE(Electronics)1.

An awarding organisation has a legal obligation under the 2009 Act to have regard to this guidance, where relevant, in relation to each GCE Qualification in Electronics that it makes available or proposes to make available. Condition GCE(Electronics)1

¹ www.gov.uk/government/publications/gce-subject-level-conditions-and-requirements-for-electronics

imposes the same obligation in respect of the guidance below which is issued under that Condition.

An awarding organisation should use the guidance in this document to help it understand how to comply with the *GCE Subject Level Conditions and Requirements for Electronics*.

Guidance set out in this document

<p>This document provides guidance on assessment objectives for GCE Qualifications in Electronics.</p>

Guidance on assessment objectives for GCE Qualifications in Electronics

Condition GCE(Electronics)1.2 allows us to specify requirements and guidance relating to assessment objectives for GCE Qualifications in Electronics.

We published our requirements in relation to assessment objectives in *GCE Subject Level Conditions and Requirements for Electronics*, and reproduce them in the table below.

	Objective	Weighting (A level)	Weighting (AS)
AO1	Demonstrate knowledge and understanding of the ideas, techniques and procedures of electronics	30-35%	30-35%
AO2	Apply knowledge and understanding of the ideas, techniques and procedures of electronics	35-40%	35-40%
AO3	Analyse problems and design, build, test and evaluate electronic systems to address identified needs	30%	30%

We set out below our guidance for the purposes of Condition GCE(Electronics)1.2. This guidance explains how we expect awarding organisations to interpret these assessment objectives in terms of:

- the discrete 'elements' within each assessment objective that questions and tasks could target and/or seek to credit – our expectation is that each and every question/task should target or seek to credit at least one of these elements, and may target or seek to credit multiple elements across one or more assessment objectives;
- the coverage expectations, such as in relation to the different elements within each assessment objective and how those elements should be sampled over time; and
- the key areas of emphasis in each assessment objective and the particular meaning for the subject of any key terms and phrases used; defined terms are shown in bold text, followed by their definitions.

In line with the obligations set out in Condition GCE(Electronics)1.2, we expect awarding organisations to be able to demonstrate how they have had regard to this guidance. For example, an awarding organisation could map how it has regard to the guidance as it:

- develops its sample assessment materials;
- delivers the qualification;
- develops and applies its approach to sampling the elements into which the assessment objectives are divided; and
- monitors the qualification to make sure it addresses all elements appropriately.

AO1 – Demonstrate knowledge and understanding of the ideas, techniques and procedures of electronics.		30-35% (A level) 30-35% (AS)	
Strands	Elements	Coverage	Interpretations and Definitions
n/a	<p>1a – Demonstrate knowledge and understanding of the ideas of electronics.</p> <p>1b – Demonstrate knowledge and understanding of the techniques and procedures of electronics.</p>	<ul style="list-style-type: none"> ■ Full coverage in each set of assessments² (but not every assessment). ■ A reasonable balance between the elements within this assessment objective. ■ Awarding organisations should justify the balance between elements 1a and 1b in their assessment strategies. ■ No more than 10% of the total marks for the qualification should reward demonstrating knowledge in isolation³. 	<ul style="list-style-type: none"> ■ Ideas, techniques and procedures of electronics are aspects of subject content. In the context of this assessment objective – <ul style="list-style-type: none"> □ ideas include the subject-specific requirements as set out in the document published by the Secretary of State entitled ‘Electronics GCE AS and A level subject content’, document reference DFE-00038-2016 (the ‘Content Document’) – for example, the concepts of electronics and the equations and units that are used in electronics. □ techniques and procedures include processes and methods, how to do something and why it should be done in a particular way, for example as part of solving a problem or producing a product. ■ The emphasis in this assessment objective is on learners recalling knowledge and communicating relevant knowledge and understanding from the course of study – for instance, of facts, definitions and the behaviour of electronic components and circuits.

² For the purposes of this guidance, a ‘set of assessments’ means the assessments to be taken by a particular Learner for a GCE Qualification in Electronics. For clarity, the assessments taken by Learners may vary, depending on any possible routes through the qualification.

³ Marks which ‘reward demonstrating knowledge in isolation’ means any mark awarded solely for recalling facts or other knowledge. It does not include marks awarded for selecting appropriate knowledge (for example, to evidence an argument), or for applying knowledge to a particular context.

AO2 – Apply knowledge and understanding of the ideas, techniques and procedures of electronics			35-40% (A level) 35-40% (AS)
Strands	Elements	Coverage	Interpretations and Definitions
n/a	1a – Apply knowledge and understanding of the ideas of electronics.	<ul style="list-style-type: none"> ■ Full coverage in each set of assessments (but not every assessment). ■ A reasonable balance between the elements within this assessment objective. ■ Awarding organisations should justify the balance between elements 1a and 1b in their assessment strategies. 	<ul style="list-style-type: none"> ■ The emphasis in this assessment objective is on Learners applying their knowledge and understanding to provide meaning or explanation – for instance, to connect theory with particular contexts, stimuli or materials. This application should relate principally to: <ul style="list-style-type: none"> □ novel situations that are not clearly indicated in the specification, □ developing further material that is covered in the specification, □ making links between such types of material, which are not signalled in the specification, and □ identifying appropriate techniques and measuring instruments. ■ The application should also involve determining how to make sense of connections and linkages within information and detail; though not to the extent of reaching conclusions or making judgements.
	1b – Apply knowledge and understanding of the techniques and procedures of electronics.		

AO3 - Analyse problems and design, build, test and evaluate electronic systems to address identified needs		30% (A level) 30% (AS)	
Strands	Elements	Coverage	Interpretations and Definitions
n/a	1a – Analyse problems and design electronic systems to address identified needs.	<ul style="list-style-type: none"> ■ Full coverage in each set of assessments (but not in every assessment). ■ A reasonable balance between the elements within this assessment objective. ■ Awarding organisations should justify the balance between elements 1a to 1d in their assessment strategies. ■ Elements 1b and 1c should only be assessed through non-exam assessment. Elements 1a and 1d must be assessed through the Assessments by Examination, but may also be assessed through non-exam assessment. 	<ul style="list-style-type: none"> ■ In the context of this assessment objective – <ul style="list-style-type: none"> □ Problems should be interpreted consistently with the definition given in paragraph 10 of the Content Document. □ Analyse means deconstructing a problem or context to identify a need and making links to the knowledge and understanding in the subject content. □ Design means synthesising different aspects of knowledge and understanding to propose a working electronic solution. □ Build is the process of constructing or assembling circuits or programming microcontrollers. □ Test is the process of using appropriate techniques and instruments to make judgements about the performance of electronic solutions. □ Electronic systems includes, analogue, digital and microcontroller circuits. ■ In the evaluation of electronic systems, where element 1d is assessed through non-exam assessment, Learners should be expected to demonstrate that they have reflected upon the performance of the system against the design brief, and justified changes and/or improvements during the development of the solution.
	1b – Analyse problems and build electronic systems to address identified needs.		
	1c – Analyse problems and test electronic systems to address identified needs.		
	1d – Analyse problems and evaluate electronic systems to address identified needs.		

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