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Guidance

GCSE subject-level conditions and requirements for engineering (2022)

Published 11 November 2021

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Introduction



About this document

This document is part of a suite of documents which sets out the regulatory requirements for awarding organisations offering GCSE qualifications (graded from 9 to 1) in 2022.

We have developed these requirements with the intention that GCSE qualifications (graded from 9 to 1) should provide:

- evidence of students' achievements against demanding and fulfilling content
- a strong foundation for further academic and vocational study and for employment
- a basis for schools and colleges to be held accountable for the performance of all of their students, if required

Requirements set out in this document

This document sets out the GCSE Subject Level Conditions for Engineering (2022). These conditions will come into effect at 09:30 on 12 November 2021 for all GCSE qualifications (graded from 9 to 1) in Engineering for Learners completing the qualification in 2022, except where the General Qualifications Alternative Awarding Framework applies.

It also sets out our requirements in relation to:

- interpretation of subject content - awarding organisations must comply with these requirements under Condition GCSE(Engineering)1.1(c)
- assessment objectives - awarding organisations must comply with these requirements under Condition GCSE(Engineering)1.2
- assessment - awarding organisations must comply with these requirements under Condition GCSE(Engineering)2.3

With respect to GCSE qualifications (graded from 9 to 1) in Engineering in 2022, awarding organisations must also comply with:

- our [General Conditions of Recognition](#), which apply to all awarding organisations and qualifications
- our [GCSE Qualification Level Conditions](#)
- all [relevant Regulatory Documents](#)

With respect to GCSE qualifications in Engineering taken by Learners completing the qualification in 2023 and after, an awarding organisation must continue to comply with the [GCSE Subject Level Conditions and Requirements for Engineering](#).

Subject Level Conditions

GCSE Subject Level Conditions for Engineering

Condition GCSE(Engineering) 1: Compliance with content requirements

GCSE (Engineering)1.1

In respect of each GCSE Qualification in Engineering which it makes available, or proposes to make available, an awarding organisation must -

- (a) comply with the requirements relating to that qualification set out in the document published by the Secretary of State entitled '[Engineering GCSE subject content](#)', document reference DFE-00196-2015,
- (b) have regard to any recommendations or guidelines relating to that qualification set out in that document, and
- (c) interpret that document in accordance with any requirements, and having regard to any guidance, which may be published by Ofqual and revised from time to time.

GCSE (Engineering)1.2

In respect of each GCSE Qualification in Engineering which it makes available, or proposes to make available, an awarding organisation must comply with any requirements, and have regard to any guidance, relating to the objectives to be met by any assessment for that qualification which may be published by Ofqual and revised from time to time.

Condition GCSE(Engineering) 2: Assessment

GCSE (Engineering)2.1

Condition GCSE4.1 does not apply to any GCSE Qualification in Engineering which an awarding organisation makes available or proposes to make available.

GCSE (Engineering)2.2

In respect of the total marks available for a GCSE Qualification in Engineering which it makes available, an awarding organisation must ensure that -

- (a) 60 per cent of those marks are made available through Assessments by Examination, and
- (b) 40 per cent of those marks are made available through assessments set by the awarding organisation that are not Assessments by Examination.

GCSE(Engineering)2.3

An awarding organisation must ensure that in respect of each assessment for a GCSE Qualification in Engineering which it makes available it complies with any requirements, and has regard to any guidance, which may be published by Ofqual and revised from time to time.

Interpretation of subject content

Requirements in relation to subject content for GCSE Qualifications in Engineering

The subject content for GCSE Qualifications in Engineering is set out in the document published by the Secretary of State entitled '[Engineering GCSE subject content](#)', document reference DFE-00196-2015 (the 'Content Document').

Condition GCSE(Engineering)1.1(c) requires awarding organisations to interpret the Content Document in line with any requirements published by Ofqual.

We set out our requirements for the purposes of Condition GCSE(Engineering)1.1(c) below.

Practical engineering skills

An awarding organisation must interpret paragraphs 4 and 15 of the Content Document as if -

- (a) the reference to practical engineering skills allows for Learners to produce clear and detailed intentions of prototypes rather than a finished product, and
- (b) a Learner may watch a demonstration of the use of a range of materials, parts, components, tools and equipment rather than use them him or herself.

Equations

The Appendix to the Content Document specifies a list of 'Equations in GCSE Engineering' that:

students should be able to recall correctly and apply [...] using standard SI units

In respect of each GCSE Qualification in Engineering which it makes available, or proposes to make available, an awarding organisation must -

- (a) interpret the above requirement in the Content Document as permitting the awarding organisation to set individual questions and/or tasks which require Learners to -
 - (i) recall one or more of those specified equations, and/or
 - (ii) recall, and then apply, one or more of those specified equations, and/or
 - (iii) apply one or more of those specified equations which is given in the question and/or task, and

(b) design and set the assessments for that qualification such that, over the shortest period of time that is reasonably practicable, those assessments require Learners to demonstrate their ability to recall, and then apply, each of the equations listed in the Appendix to the Content Document.

Assessment objectives

Assessment objectives - GCSE Qualifications in Engineering

Condition GCSE(Engineering)1.2 allows us to specify requirements relating to the objectives to be met by any assessment for GCSE Qualifications in Engineering.

The assessment objectives set out below constitute requirements for the purposes of Condition GCSE(Engineering)1.2. Awarding organisations must comply with these requirements in relation to all GCSE Qualifications in Engineering they make available.

Assessment objective	Description	Weighting
AO1	Demonstrate knowledge and understanding of engineering principles and processes	25%
AO2	Apply knowledge, understanding and skills in different contexts, including through the use of a range of tools, equipment, materials, components and manufacturing processes ^{footnote 1}	50%
AO3	Analyse and evaluate evidence in relation to a range of engineering contexts	25%

Assessment requirements

Assessment requirements - GCSE Qualifications in Engineering

Condition GCSE(Engineering)2.3 allows us to specify requirements in relation to assessments for GCSE Qualifications in Engineering.

We set out below our requirements for the purposes of Condition

GCSE(Engineering)2.3. Awarding organisations must comply with these requirements in relation to all GCSE Qualifications in Engineering they make available.

Assessment of mathematical content

Pages 8 and 9 of the Content Document specify the mathematical skills, knowledge and understanding which Learners will be required to use in GCSE Qualifications in Engineering (the 'Mathematical Skills').

In designing and setting the Assessments by Examination for a GCSE Qualification in Engineering which it makes available, or proposes to make available, an awarding organisation must ensure that -

- (a) questions and tasks rewarding the use of Mathematical Skills assess those skills within the context of other areas of the subject content, and not in isolation,
- (b) at least 20 per cent of the marks in those Assessments by Examination reward the use of Mathematical Skills at a Level of Demand which is not lower than that which is expected of Learners at Key Stage 3 as outlined in the Department for Education's document 'Mathematics programmes of study: key stage 3', document reference DFE-00179-2013, and
- (c) without prejudice to the above requirements and those outlined in the Content Document, in each set of assessments^{[\[footnote 2\]](#)} Mathematical Skills are assessed across a range of Levels of Demand which supports effective differentiation in relation to the qualification.

Non-examination Assessment

Condition GCSE(Engineering)2.2(b) states that an awarding organisation must ensure that, of the total marks available for a GCSE Qualification in Engineering, 40 per cent of those marks are made available through assessments set by the awarding organisation which are not Assessments by Examination.

In respect of that 40 per cent, an awarding organisation must ensure that the marks are comprised as follows -

- (a) 30 per cent of the total marks for the qualification through marks made available in respect of assessment objective AO2, and
- (b) 10 per cent of the total marks for the qualification through marks available in respect of assessment objective AO3.

In respect of the assessments which are not Assessments by Examination, an awarding organisation must ensure that each Learner is required to complete a single task which -

- (a) is designed and set to -
 - (i) allow the Learner to demonstrate the practical engineering skills specified in paragraph 15 of the Content Document as interpreted in line with the requirements published under Condition GCSE(Engineering)1.1(c), and

- (ii) be completed by the Learner during periods of assessment totalling approximately 30 hours,
- (b) requires the Learner to produce the following evidence -
 - (i) Either -
 - (A) a single engineered product based on a brief set by the awarding organisation, or
 - (B) a prototype and/or clear and detailed intentions in relation to a prototype,
 - (ii) Such additional evidence as is necessary to enable the consideration of that Learner's level of attainment in respect of all of the relevant criteria against which Learners' performance in that assessment will be differentiated, and
- (c) must be taken under conditions specified by the awarding organisation, including, in particular, conditions which -
 - (i) ensure that the evidence generated by each Learner can be Authenticated, and
 - (ii) require each Learner to produce the evidence set out in paragraph (b) above under Immediate Guidance or Supervision.

In respect of the brief(s) it sets for the assessments which are not Assessments by Examination, an awarding organisation -

- (a) must design and set those brief(s) in a way which -
 - (i) minimises the predictability of non-examination assessment tasks in any given set of assessments, and
 - (ii) facilitates comparability of non-examination assessment tasks, both within a set of assessments, and over time, and
- (b) must not communicate the brief(s) that it has set before 1 June in the calendar year preceding the year in which the qualification is to be awarded.

Marking of non-examination assessments

Evidence generated by a Learner in an assessment for a GCSE Qualification in Engineering which is not an Assessment by Examination may be marked -

- (a) by the awarding organisation or a person connected to the awarding organisation,
- (b) by a Centre, or
- (c) through a combination of (a) and (b).

In any event, the awarding organisation must demonstrate to Ofqual's satisfaction in its assessment strategy that -

- (a) it has taken all reasonable steps to identify the risk of any Adverse Effect which may result from its approach to marking the assessments (and to Moderation where appropriate); and

(b) where such a risk is identified, it has taken all reasonable steps to prevent that Adverse Effect or, where it cannot be prevented, to mitigate that Adverse Effect.

1. To be interpreted in line with the requirements on practical engineering skills published under Condition GCSE(Engineering)1.1(c).↵
2. For the purposes of these requirements, a 'set of assessments' means the assessments to be taken by a particular Learner for a GCSE Qualification in Engineering. For clarity, the assessments taken by Learners may vary, depending on any possible routes through the qualification.↵

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