APPROVAL CRITERIA FOR GCSE COMPUTER SCIENCE

JULY 2016

Contents

This is a **Regulatory Document** under **Condition B7** of the *Interim Standard Conditions of Recognition[1]: Compliance with Regulatory Documents.*

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[1] http://qualificationswales.org/regulation/monitoring-awarding-bodies/?lang=en&

Introduction

This document sets out the approval criteria for GCSE Computer Science. These have been developed through stakeholder engagement and public consultation. They include the requirements that an awarding body must meet when developing the specification and assessment materials for the qualification.

The approval criteria in this document will come into effect from 18 July 2016.

Qualifications Wales will only approve qualifications that meet all of the requirements set out in this document together with those set out in the *GCSE Qualification Approval Criteria[2]* and *Interim Standard Conditions of Recognition[3]*. In developing qualifications to meet these requirements awarding bodies must have regard to *Fair Access by Design[4]*.

Where the requirements of the Subject Approval Criteria set out in this document differ from those prescribed in the *GCSE Qualifications Approval Criteria* and the *Interim Standard Conditions of Recognition*, the requirements in this document will take precedence.

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[2] http://qualificationswales.org/regulation/approved-and-designated-qualifications/gcse-approval-criteria-july-2016/?lang=en
[3] http://qualificationswales.org/regulation/monitoring-awarding-bodies/?lang=en&
[4] http://gov.wales/docs/dcells/publications/150727-fair-access-by-design-en.pdf

Subject aims and objectives

1. GCSE Computer Science specifications must enable learners to:

    1.1. understand and apply the fundamental principles and concepts of computer science, including; abstraction, decomposition, logic, algorithms, and data representation;

    1.2. analyse problems in computational terms through practical experience of solving such problems, including designing, writing and debugging programs;

    1.3. think creatively, innovatively, analytically, logically and critically;

    1.4. understand the components that make up digital systems, and how they communicate with one another and with other systems;

    1.5. understand the impact of digital technology to the individual and to wider society;

    1.6. apply mathematical skills relevant to computer science.

Subject content

2. The subject content of GCSE Computer Science specifications must reflect the subject aims and objectives.

3. GCSE Computer Science specifications must require learners to understand and have knowledge of the following topics:
    3.1. standard algorithms including binary search and merge sort;

    3.2. following and writing algorithms to solve problems;

    3.3. data types and data structures;

    3.4. representation of numbers;

    3.5. representation of data: text, sound and graphics;

    3.6. Boolean logic;

    3.7. system software;

    3.8. system architecture;

    3.9. networks and the importance of networks in digital technology;

    3.10. levels of programming language;

    3.11. cyber security;

    3.12. the ethical, legal and environmental impact of digital technology.

Rationale Required: on submitting the GCSE specification the awarding body will be required to provide rationale regarding the breadth and depth of content assessed in each topic.

Skills

4. GCSE Computer Science specifications must require learners to:

  4.1. take a systematic approach to problem solving;

  4.2. design, write, test and refine programs with a textual program definition;

  4.3. use appropriate security techniques;

  4.4. evaluate the fitness for purpose of algorithms[5];

  4.5. use abstraction effectively to model selected aspects of the external world in a program and to structure programs appropriately;

  4.6. apply computing-related mathematics.

Rationale Required: on submitting the GCSE specification the awarding body will be required to provide rationale of how the subject content will support learners to develop the skills in paragraph 4.

Assessment objectives

5. The assessment of the knowledge, understanding, and skills required in the specification must target the following assessment objectives in line with the indicated weightings:

Objective	Requirements	Weighting
AO1	Demonstrate knowledge and understanding of the key concepts and principles of computer science.	30%
AO2	Apply knowledge and understanding of key concepts and principles of computer science.	40%
AO3	Analyse problems in computational terms to make reasoned judgements and to design, program, evaluate and refine solutions.	30%

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[5] Formal comparisons of algorithmic efficiency are not required.

Scheme of assessment

6. GCSE Computer Science will have 20% of the assessment weighting allocated to non-examination assessment.

7. The non-examination assessment must be designed and set to be taken under conditions specified by the awarding organisation, including, in particular, conditions which ensure that the evidence generated by each learner can be authenticated.

8. GCSE Computer Science must not be tiered.

9. GCSE Computer Science must be linear.

Rationale Required: on submitting the GCSE specification the awarding body must provide a rationale for how the approach to non-examination assessment will ensure the validity, reliability and manageability of assessment.

Further information

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