



# Higher Computing and Information Science — draft Course rationale and summary

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# Course rationale

## Background

All new and revised National Courses reflect Curriculum for Excellence values, purposes and principles. They offer flexibility, provide more time for learning, more focus on skills and applying learning, and scope for personalisation and choice.

In this Course, and its component Units, there will be emphasis on skills development and the application of those skills. Assessment approaches will be proportionate and fit for purpose and they will promote best practice, enabling learners to achieve the highest standards they can.

This Course provides learners with opportunities to continue to acquire and develop the attributes and capabilities of the four capacities as well as skills for learning, skills for life and skills for work.

All Courses provide opportunities for learners to develop breadth, challenge and application, but the focus and balance of the assessment will be appropriate for the subject area.

## **Relationship between the Course and Curriculum for Excellence values, purposes and principles**

The Course provides an understanding of the technologies that underpin the digital world and develops transferrable skills. It brings together elements of technology and science and has wide-ranging social implications, providing an excellent opportunity for making links across learning in the senior phase.

At this level, the Course will cover a common core of concepts which underpin the study of computing and information science, and provide insight into the challenge, excitement and fascination to be found in these areas.

The Course encourages learners to become successful, responsible and creative and to continue to acquire and develop the attributes and capabilities of the four capacities, including: creativity, flexibility and adaptability; enthusiasm and a willingness to learn; perseverance, independence and resilience; responsibility and reliability; and confidence and enterprise.

The Course provides progression from Computing and Information Science (National 5).

## **Purpose and aims of the Course**

Computing and information science is vital to everyday life; it shapes the world in which we live and its future. Computer scientists play key roles in meeting the needs of society today and for the future, in fields which include science, communications, entertainment, education, business and industry. Our society needs more computer scientists and for all young people to have an informed view of the IT industry and its contribution to the economy.'

The aims of the Course are to enable learners to:

- ◆ extend and apply knowledge and understanding of key concepts in computing and information science
- ◆ develop and apply aspects of computational thinking in a range of contexts
- ◆ apply analysis, design, modelling and evaluation to a range of increasingly complex problems
- ◆ communicate clearly and concisely using appropriate terminology
- ◆ develop a greater understanding of the impact of computing and information technology in transforming and influencing our environment and society

Related to these aims, and underlying the study of computing and information science, are a number of unifying themes, including computational thinking, technological progress and trends, the relationship between software, hardware and system performance, and information representation and transfer as a core

component of any computation. These are used to explore a variety of specialist areas through practical and investigative tasks.

## **Information about typical learners who might do the Course**

The Course is designed for learners who have a general interest in computing and information science, as well as those considering further study or a career in computing and information science and related disciplines. It provides sufficient breadth, flexibility and choice to meet the needs of all learners.

Learners will develop a deeper understanding of the central role of computer scientists as problem-solvers and designers, able to design, implement and operate hardware and software systems, and the far-reaching impact of information technology on our society and the environment. They will also continue to develop a range of transferable skills for learning, skills for life and skills for work, opening up a wide range of career and study opportunities.

On completing the Course, learners will have developed and strengthened their skills in analysis and problem-solving, design and modelling, developing and implementing solutions, and evaluating digital solutions.

Course activities also provide opportunities for learners to enhance generic and transferable skills in planning and organising, working independently and in teams, critical thinking and decision making, research, communication and self- and peer-evaluation, in a range of contexts.

The Course or its components may provide progression to:

- ◆ Advanced Higher Computing and Information Science
- ◆ a range of computing-related NPAs
- ◆ National Certificate Group Awards (NCGAs) in Digital Media Computing
- ◆ employment, apprenticeships and/or training as an IT professional in a range of industries

and ultimately, for some, to:

- ◆ a range of computing-related Higher National Certificates (HNCs) and Higher National Diplomas (HNDs)
- ◆ degrees in Computer Science, Information Systems and related disciplines
- ◆ careers in the IT industry

## **Course summary**

**Course title: Higher Computing and Information Science**

**SCQF level 6 (24 SCQF credit points)**

### **Course outline**

#### **Mandatory Units**

Software Design and Development (Higher) (9 SCQF credit points)

Information System Design and Development (Higher) (9 SCQF credit points)

#### **Course assessment**

(6 SCQF credit points)

This Course includes six SCQF credit points for 40 additional programmed hours to allow preparation for Course assessment. The Course assessment covers the added value of the Course. Further information on the Course assessment is provided in the Assessment section.

## **Course structure and conditions of award**

The Course enables learners to develop and extend, across a range of contemporary contexts related to the design and development of software and information systems, a range of skills including analysis and problem solving, design and modelling, and developing, implementing and evaluating digital solutions.

The Course also enables learners to develop and extend knowledge and understanding of key concepts and processes, and the ability to apply this to a variety of problems; and an understanding and evaluation of the impact of computing and information technology on the environment and society.

Units are statements of standards for assessment and not programmes of learning and teaching. They can be delivered in a variety of ways.

Each of the component Units of the Course is designed to provide progression from the related Unit at National 5, and to the related Unit at Advanced Higher.

### **Software Design and Development (Higher)**

This Unit explores an appropriate range of key facts and ideas relating to software design and development, including relatively complex algorithms, data handling and human computer interaction. Learners will develop skills in problem solving, modelling and evaluating through practical tasks, using appropriate programming environments in a range of contemporary contexts, such as games development and intelligent systems. These tasks will involve complex features and both familiar and unfamiliar contexts which will require interpretation on the part of the learner. Learners will also explore trends in software development and the impact of emerging and innovative technologies on the environment and society.

### **Information System Design and Development (Higher)**

This Unit explores an appropriate range of key facts and ideas relating to information system design and development. Learners will develop their knowledge and understanding of information system hardware, security, database systems, web-based information systems and multimedia information systems through a range of practical and investigative tasks. These tasks will involve complex features and both familiar and unfamiliar contexts which will require interpretation on the part of the learner. Learners will also explore legal and economic issues, as well as the impact of emerging and innovative technologies on the environment and society.

To gain the award of the Course, the learner must pass all the Units as well as the Course assessment. The required Units are shown in the Course outline section. Course assessment will provide the basis for grading attainment in the Course award.

## Assessment

Information about assessment standards for the Course will be included in the *Course Assessment Specification*, which will provide full details including advice on how a learner's overall attainment for the Course will be determined.

### Unit assessment

All Units are internally assessed against the requirements shown in Unit specifications.

They will be assessed pass/fail within centres.

SQA will provide rigorous external quality assurance, including external verification, to ensure assessment judgements are consistent and meet national standards.

Exemplification of possible assessment approaches for these Units will be provided in the *National Assessment Resource*.

### Course assessment

Courses from National 4 to Advanced Higher include assessment of added value<sup>1</sup>. At National 5, Higher and Advanced Higher, the added value will be assessed in the Course assessment. The added value for the Course will address the key purposes and aims of the Course as defined in the Course Rationale. It will do this by addressing one or more of breadth, challenge and application.

In the Higher Computing and Information Science Course, added value will focus on:

- ◆ breadth
- ◆ challenge
- ◆ application

Learners will draw on, extend and apply the skills and knowledge they have developed during the Course. These will be assessed through a combination of a [project](#)<sup>2</sup> and a [question paper](#)<sup>3</sup>.

The Computing and Information Science project adds value by requiring challenge and application. Learners will apply knowledge and skills from the Units to solve an appropriately challenging computing and information science problem.

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<sup>1</sup> Definitions can be found here: [www.sqa.org.uk/sqa/45528.html](http://www.sqa.org.uk/sqa/45528.html)

<sup>2</sup> See link above for definitions.

<sup>3</sup> See link above for definitions.

*successful learner, confident individual, responsible citizen, effective contributor*

The question paper introduces breadth to the assessment. It requires depth of understanding and application of knowledge from the Units.

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