

EDEXCEL  
FOUNDATION



# BTEC Higher Nationals in Computing

## Course Overview

This **Course Information** document gives centres advice and recommendations on how to plan, design and structure the programme, which will enable them to manage and implement the Edexcel BTEC Higher National qualifications in Computing.

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## 1.0 INTRODUCTION

The purpose of this guidance is to give centres advice and recommendations which will enable them to manage and implement the Edexcel BTEC Higher National qualifications in Computing.

Programmes approved under this guidance will lead to the award of an Edexcel BTEC Higher National Certificate or Diploma in one of the following:

- Computing
- Computing (Software Engineering)
- Computing (Business Information Technology)

This guidance specifies the knowledge, understanding, skills and assessment requirements of the Edexcel BTEC Higher National programmes in Computing. It identifies the boundaries within which centres must design and operate the Higher National programmes in Computing. Centres may seek approval for programmes leading to more than one of these titles. However, individual students are only eligible for one award title per programme of study.

This guidance should be read in conjunction with the current issue of the Edexcel BTEC Policy Framework and Qualification Forms, which contain the general requirements to run an Edexcel programme. Licensed centres wishing to use the named award titles must design programme(s) within the specified structure.

### 1.1 About this guidance

This guidance replaces the 1990 guidance for Higher National programmes in Computing, Software Engineering and Business Information Technology. All new submissions must be validated using this new guidance.

Centres currently approved under the 1990 guidance will be allowed a transitional period onto the new programmes. However, all centres must gain approval under this new guidance for all programmes beginning September 2000.

## 1.2 Rationale

The Edexcel BTEC Higher National qualifications in Computing are designed to equip students with the knowledge, understanding and skills required for success in current and future employment or for progression to an undergraduate degree. These transferable skills will enable students to meet changing circumstances, whether these arise from a shift in their own sphere of employment, promotion to supervisory or management roles or from general changes in computing practices and the information technology environment.

The qualifications have been developed to meet the needs of the major functions in computing, hence the inclusion of the functional pathways (Software Engineering and Business Information Technology).

These qualifications provide:

- nationally recognised qualifications with detailed standards for centres, students and employers
- guidance for centres with their own quality assurance procedures
- a focus on independent learning and practical knowledge and skills. Such a focus highlights the need for a common core study with related functional pathways into employment, professional or academic progression
- a Computing pathway which provides the flexibility for centres to devise units of study to meet local or specialist needs. The related functional pathways of Software Engineering and Business Information Technology have been identified on the basis of popular demand from prospective students, providers, employers and professional bodies
- for a modular approach which allows the aspirations of different students to be met. Students may complete single units, several units or complete programmes. Centres are free to make their own decisions about sequencing of units, delivery mechanisms and assessment strategies.

## 1.3 Aims

The Higher National qualifications in Computing are designed to meet the following aims:

- to provide an educational foundation for a range of technical and management careers in computing
- to provide specialised studies directly relevant to individual vocations and professions in which students are working or intend to seek employment

to enable students to make an immediate contribution in employment

- to provide flexibility, knowledge, skills and motivation as a basis for career development and as a basis for progression to graduate and postgraduate studies
- to develop students' ability in computing through effective use and combination of the knowledge and skills gained in different parts of the programme
- to develop a range of skills and techniques, personal qualities and attitudes essential for successful performance in working life.

## 1.4 Professional recognition

Edexcel is in contact with the British Computer Society (BCS) to work towards ensuring that the proposed syllabus for the Higher National in Computing qualification is in line with BCS and Engineering Council requirements for accreditation and exemption from the BCS Examination.

Any college wishing to apply for exemption or affiliation will need to make an application on an individual basis and should contact the BCS in the first instance at the following address:

**The British Computer Society**  
**1 Sanford Street**  
**Swindon SN1 1HJ**

**Tel: 01793 417417**  
**Fax: 01793 480270**  
**WWW: <http://www.bcs.org.uk>**

Information about the Engineering Council's *Standards and Routes for Registration* (SARTOR) is contained in Annex B of this guidance.

## 2.0 PLANNING THE PROGRAMME

Any centre wanting to run a Higher National qualification in Computing should consider:

- the needs of the market in terms of individual students and regional employers
- the requirement for recognition by computing professional institutions, in particular the Engineering Council, as specified in Standards and Routes to Registration (see Annex B for current recognition of Edexcel BTEC Higher Nationals)
- the structure, content, delivery and assessment methods to enable the programme's learning outcomes to be achieved in a motivating way
- the resource requirements for preparation, launch and implementation of the programme
- the use of students' employment backgrounds and work-based learning programmes to enhance delivery and relevance
- the review procedures necessary to ensure that programmes are constantly revised to reflect the changing needs of computing
- progression to degree level/professional NVQ qualifications.

## 2.1 Access

It is the responsibility of the centre to recruit with integrity. Centres must therefore:

- provide applicants with appropriate information
- identify applicants' needs
- select in the light of applicants' previous qualifications and experience.

Edexcel BTEC Higher National programmes are intended primarily for those who are in, or plan to enter, employment and who have reached the minimum age of eighteen. The qualifications have been designed on the assumption that they are available, without artificial barriers which restrict access and progression, to everyone who can achieve the required standard. However students who enter with at least one of the following are likely to benefit more readily from the programme:

- an Edexcel BTEC National Certificate or Diploma in a computing discipline
- an Edexcel BTEC Advanced GNVQ (e.g. in Computer Studies or Information Technology)
- an Edexcel BTEC National Certificate or Diploma of any other related title
- at least one GCE A level pass, with appropriate supporting passes at GCSE at Grades A, B or C in an appropriate mathematics or technology subject
- for mature candidates, appropriate work experience.

For students already in employment or with relevant previous experience, Edexcel's introduction in 1990 of the Accreditation of Prior Learning (APL) ensures that outcomes already achieved by an applicant, whether through experience or through other qualifications, can be identified, authenticated and accredited against the qualification specification without the need for repetition.

Any student able to demonstrate that all the requirements for one or more units are met should be accredited with that achievement and be eligible for certification.

No time limit is placed by Edexcel on the completion of an individual programme, up to the normal Edexcel registration period of five years (which is itself renewable). Students may, if they wish, take only parts of a qualification for separate accreditation and certification.

## 3.0 PROGRAMME DESIGN AND STRUCTURE

In order to achieve the programme aims, centres should devise a structured learning experience to deliver the qualification outcomes.

### 3.1 Programme design

Centres are encouraged to reflect changes in the computing and information technology environment in the content of units, while delivering the qualification outcomes. Programme design and delivery should reflect the balance of skills and knowledge needed to competently work in the computing and information technology environment. Centres should take care to balance and integrate theory and practice, to ensure that the qualification supports both career prospects and educational progression.

The Higher National qualifications in computing:

- are normally designed to last for two years, although individual students programmes may vary from this depending on prior experience and learning (APL) and the mode of delivery
- require a Diploma to comprise **16 units** and a Certificate **10 units**, each unit having a unit value of 1.0 (except the advanced project which has a value of 2.0)
- comprise **core units** which are compulsory, the Diploma core has a unit value of 9.0, the Certificate core has a unit value of 5.0
- comprise **option units** which form specific functional pathways and are grouped to form the qualification titles: **Computing**, **Computing (Software Engineering)** and **Computing (Business Information Technology)**.

### 3.2 Unit design

The Higher National qualifications consist of standard unit templates which include clearly defined outcomes and content, robust assessment criteria and clear grading criteria ensuring standards, credibility and rigour.

The qualifications consist of units which have a notional level indicator of H1 or H2, indicating the relative intellectual demand, complexity and depth of study, and learner autonomy.

At **H1 level** the emphasis is on the application of knowledge, skills and understanding; use of conventions in the field of study; use of analytical skills and selection and organisation of information.

At **H2 level** the emphasis is on application and evaluation of contrasting ideas, principles, theories and practices; greater specialism in the field by study; and an increasing independence in systematic enquiry and analysis.

In designing programmes of study to fulfil progression arrangements centres have flexibility in selecting appropriate combinations of H1 and H2 units for the option pathways.

All units are designed to recognise the importance of the development of skills through the integration of **Common Skills**.

### 3.3 Centre choice of units

Centres applying to offer Higher National qualifications may include, in the option pathways their own choice of units. This flexibility is limited to a total of **4 units** at the Diploma level and up to **2 units** at the Certificate level.

Centre choice may be based on:

- appropriate units from other Higher National vocational areas
- proposals for units submitted to Edexcel to meet regional needs
- appropriate language units.

Centre choice of units must demonstrate their contribution to the coherence of the qualification and will be subject to approval.

### 3.4 Language units

Development work on revised language guidance is currently underway. Updated language units will be available for September 1998.

### 3.5 Programme structure

The qualification comprises:

- core units:
  - there are five core units which are common to all pathways within the Higher National Certificate and Diploma framework (this includes an implementation project which is specific to each pathway)
  - for the Higher National Diploma there are a further three core units which are common across all pathways (this includes an advanced project that is specific to each pathway and has a unit value of 2.0, making the total value of the HND core 9 units)
- option units which must be selected from one of the specialist pathways:
  - Computing
  - Software Engineering
  - Business Information Technology.

All programmes must include the development and assessment of Common Skills as detailed in the *Common Skills and Core Themes Implementation Guidance* (May 1992). Other guidance and help for Common Skills development can also be found in *Common Skills and Core Themes Implementation Guidance* (May 1992). For a summary of Common Skills outcome statements, see Annex A in the Course Guidance document.

The following tables show the minimum requirements for all computing qualifications, and illustrate possible programme structures for the three specialisms.

*Figure 1 – Illustration of the minimum requirements for all Higher National qualifications in Computing.*

	<b>Higher National Certificate</b>	<b>Higher National Diploma</b>
<b>Core Units</b>	5	9
<b>Common Skills</b>	<b>In 7 Areas</b>	
<b>Option Units</b>	5	7
<b>Total Unit Value</b>	<b>10</b>	<b>16</b>
	HNC = 5 Core units + 5 Option units + Common Skills in 7 areas	HND = 9 Core units + 7 Option units + Common Skills in 7 areas

Figure 2 - Illustration of possible programme structures for the three specialisms

HIGHER NATIONALS IN COMPUTING				
	Common Core			
<b>C O R E</b>	<div style="display: flex; align-items: center; justify-content: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); text-align: center;">H N D  C O R E</div> <div style="display: flex; flex-direction: column; align-items: center; margin: 0 10px;"> <div style="border-top: 1px solid black; border-bottom: 1px solid black; width: 20px; height: 100%;"></div> <div style="margin-top: 5px;">↑</div> <div style="margin-bottom: 5px;">↓</div> </div> <div style="writing-mode: vertical-rl; text-align: center;">H N C  C O R E</div> </div>	Unit 1: Computer Platforms Unit 2: Systems Analysis Unit 3: Software Constructs & Tools Unit 4: Computing Solutions *Unit 5: Computer Implementation Project *Unit 6: Software Engineering Implementation Project *Unit 7: Business Information Technology Implementation Project Unit 8: Quality Management Principles Unit 9: Communication Technology *Unit 10: Advanced Computing Project# *Unit 11: Advanced Software Engineering Project# *Unit 12: Advanced Business Information Technology Project#		
	<b>O P T I O N</b>	<b>Computing</b> Unit 13: Networking Unit 14: Data Analysis & Database Design Unit 15: Visual Programming Unit 16: Human Computer Interface Unit 17: End User Support Unit 18: Introduction to Programming Unit 19: Computer Architecture Unit 20: Database Management Systems Unit 21: Computer Management Unit 22: Web Site Management Unit 23: Techniques of Artificial Intelligence Unit 24: Object-Oriented Programming Unit 25: Data Structures and Algorithms Unit 26: Systems Software	<b>Software Engineering</b> Unit 13: Networking Unit 14: Data Analysis & Database Design Unit 15: Visual Programming Unit 16: Human Computer Interface Unit 18: Introduction to Programming Unit 20: Database Management Systems Unit 23: Techniques of Artificial Intelligence Unit 24: Object-Oriented Programming Unit 25: Data Structures and Algorithms Unit 26: Systems Software Unit 27: Multimedia and Internet Development Unit 28: Mathematics for Software Engineering Unit 29: Software Engineering Techniques Unit 30: Computer-Based Learning Unit 31: Object-Oriented Development Unit 32: Discrete Mathematics	<b>Business Information Technology</b> Unit 13: Networking Unit 14: Data Analysis and Database Design Unit 15: Visual Programming Unit 16: Human Computer Interface Unit 17: End User Support Unit 20: Database Management Systems Unit 21: Computer Management Unit 22: Web Site Management Unit 23: Techniques of Artificial Intelligence Unit 27: Multimedia and Internet Development Unit 30: Computer-Based Learning Unit 33: Business Applications Development Unit 34: Financial Systems and Auditing Unit 35: Management Science

\* Select one from units 5, 6 or 7 for HNC and one from units 10, 11 or 12 for HND, according to pathway. # The Advanced Project has a unit value of 2

### 3.6 Unit structure

All units are defined in terms of ‘guided learning hours’. This means ‘all times when a member of staff is present to give specific guidance towards the qualification or module being studied on a programme. This includes lectures, tutorials and supervised study in, for example, open learning and learning workshops. It does not include hours where supervision or assistance is of a general nature and is not specific to the nature of the students.’

Each unit has a demand which represents approximately 60 guided learning hours.

Each unit is a set of learning outcomes, with associated content, measures and guidance. To achieve the unit all outcomes must be met by the student. Each unit is specified in the following way:

- unit title
- unit value
- unit level
- unit code
- description of unit – a description of the overall purpose of the unit
- unit outcomes – what the student must achieve
- content – an indication of the depth and breadth of knowledge, skills and understanding that should be provided to support the achievement of the outcomes
- assessment criteria – statements of what the student must be able to do, know or understand to achieve each unit
- guidance – on generating evidence, links with other parts of the learning programme, resources, delivery etc.

Centre-devised units must be specified in an outcome format, similar to that of the Edexcel devised core and option units and included in the submission for approval.

### **3.7 Common Skills**

Currently all Higher National qualifications are required to include Common Skills. These are transferable skills which play an essential role in developing personal effectiveness for adult and working life, and in the application of specific vocational skills. They provide a foundation for continual learning to enable and empower individuals who, inevitably, face a series of choices in work, education and training throughout their lives.

As the structure of industry and commerce continues to change more rapidly than ever before, with new products, services, technology, work roles and settings, all employers and employees need these Common Skills to enable them to adapt and respond creatively to change. Consequently the patterns of training and education should reflect the need for a more flexible working population.

All Edexcel qualifications at Higher National level embrace the following skill areas as an essential part of the learning programme (for a summary, see Annex A):

- Applying Numeracy
- Communicating
- Applying Technology
- Managing and Developing Self
- Working with and Relating to Others
- Managing Tasks and Solving Problems
- Applying Design and Creativity.

Centres may also wish to assess and certificate students in QCA key skills units. Key skills units are available at levels 1 to 5 in six different areas:

- Application of Number
- Communication
- Information Technology
- Personal Skills: Improving Own Learning and Performance
- Personal Skills: Working with Others
- Problem Solving.

Further information is available in the Edexcel BTEC publication *Getting Started with Key Skills in Educational and Work-based Settings*.

## **4.0 PROGRAMME DELIVERY**

Any centre offering a Higher National programme needs to provide:

- clear guidance on the routes and modes of study available and how these are supported
- opportunities to make individual learning contracts with students, to ensure that personal learning objectives are achieved
- learning activities which demonstrably help students to achieve the aims and objectives of the programme
- advice and feedback on students' progress and learning needs throughout the programme.

Those with special needs may require additional support. This could include technical aids or specially devised or adapted methods of assessment, with additional time allowed if necessary.

## 5.0 PROGRAMME MANAGEMENT

Centres will need to demonstrate the effectiveness and efficiency of the way the programme is managed and implemented. They will also need to demonstrate the effectiveness of the quality control systems that are in place to monitor the programme.

Centres should identify an appropriate delivery team, normally headed by a programme manager. The programme manager has particular responsibility for:

- the effective operation and development of the programme team
- identifying future resource and team development needs
- planning and implementing detailed review and evaluation procedures which incorporate the views of all stakeholders
- providing the link between the programme team, students and the external verifier / examiner.

The programme team have responsibility for:

- implementing recruitment and induction procedures
- implementing equal access and equal opportunities policies
- effective programme design, implementation and assessment strategies
- implementing student support systems
- effective liaison with employers
- implementing quality control systems:
  - monitoring the operation of the programme
  - monitoring student progress
  - implementing review and evaluation procedures.

Given the crucial role that the team has in the delivery of a coherent programme and the demands this may make, strong support from senior staff is essential if the team is to function effectively.

## **6.0 CRITERIA FOR APPROVAL**

New centres will need to be approved. Approved centres wanting to offer Higher National qualifications need to provide evidence of:

- the qualifications of the members of the programme team
- the relevant occupational experience of members of the programme team and their continuing professional development
- the way in which it will deliver the outcomes
- the resources and technical support available for the programme
- how the delivery and assessment methods are likely to meet the stated aims of the programme.

For further details on how to become an approved centre, or for the application procedure to offer Higher National qualifications, please contact our Customer Response Centre on 0171 393 4500.