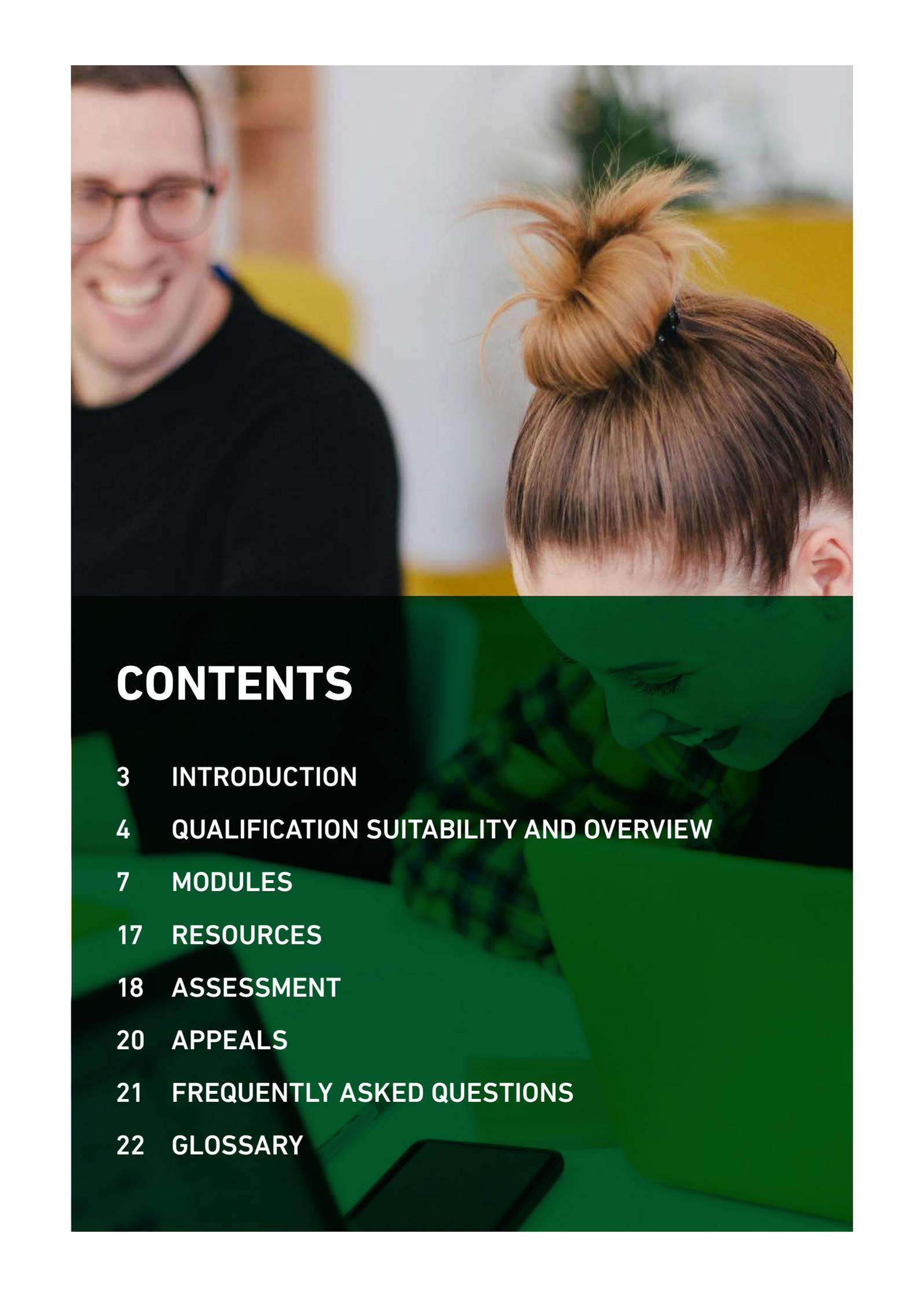


QUALIFICATION GUIDE

Higher Education Qualifications

BCS Level 6 Professional Graduate Diploma in IT
(QAN: 100/6191/5)



A photograph of a smiling man with glasses and a woman with a bun looking at a laptop screen. The image is overlaid with a dark green semi-transparent rectangle containing the table of contents.

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INTRODUCTION

The final stage within the BCS three-stage Higher Education Qualification program, the Level 6 Professional Graduate Diploma (PGD) enables candidates who have already achieved the Level 5 Diploma in IT to gain depth of knowledge and expertise in their field.

Our modules have been created in-line with the SFIAPlus framework and latest developments in the industry, giving you a competitive edge in the IT job market and showing your dedication to the industry. You will have the opportunity to learn about topics such as advanced database management, network information systems, web engineering and programming paradigms, as well as to build upon knowledge and skills developed during the Level 5 Diploma.

To successfully achieve the qualification, candidates need to complete:

- One core module (Professional Project in IT)
- Four optional modules

BCS, The Chartered Institute for IT

As the Chartered Institute for IT we are the digital specialists and the only awarding body focused on computing and IT. Our commitment under our royal charter is to ensure everyone within society, has access to the basic skills required to live and work in a digital age.

QUALIFICATION SUITABILITY AND OVERVIEW

Candidates must have achieved the Diploma in IT, or been given discretion to continue pending a re-sit of a module, or have an appropriate exemption qualification of up to 50% only to be entered for the Professional Graduate Diploma in IT.

Candidates can study for this certificate by attending a training course provided by a BCS accredited Training Provider or through self-study, although it is strongly recommended that all candidates register with an approved centre. Studying with an approved centre will deliver significant benefits.

Candidates are required to become a member of BCS, The Chartered Institute for IT, to sit and be awarded the qualifications. Candidates may apply for a four-year student membership that will support them throughout their studies.

The Level 6 Professional Graduate Diploma is suitable for professionals wishing to gain a formal IT qualification demonstrating advanced, specialist knowledge in their chosen area.

BCS LEVEL 6 PROFESSIONAL GRADUATE DIPLOMA IN IT	
QAN	100/6191/5
Entry Requirements	Level 5 Diploma in IT or appropriate exemption
Credits	141
Guided Learning Hours (GLH)	1300
Total Qualification Time (TQT)	1414
Assessment Method	Written examination with three questions from a choice of five, each with equal marks
Outcome	Pass/Fail

*See FAQs section for definitions of GLH and TQT.

COMPULSORY MODULE TITLE	UNIT CODE	GLH	ASSESSMENT METHOD
Professional Project in IT	M/503/6009	300	Practical demonstration/ assignment

OPTIONAL MODULE TITLE	UNIT CODE	GLH	ASSESSMENT METHOD
Advanced Database Management Systems	H/503/6010	250	Written examination
Computer Services Management	K/503/6011	250	Written examination
IT and the Environment	R/503/5810	250	Written examination
Management Information Systems	A/503/6014	250	Written examination
Network Information Systems	F/503/6015	250	Written examination
Programming Paradigms	J/503/6016	250	Written examination
Software Engineering 2	L/503/6017	250	Written examination
System Design Methods	R/503/6018	250	Written examination
Web Engineering	R/503/6004	250	Written examination



STRUCTURE OF THE QUALIFICATION

BCS HEQ is a three-stage UK undergraduate degree equivalent program of learning aimed at students with more limited IT knowledge, qualifications and professional experience to allow them to progress up to higher levels of knowledge and competency. HEQ is mapped into the BCS SFIPlus4 skills framework. HEQ is also one way of gaining entry to higher levels of BCS membership.

The objectives of HEQ are:

- To increase levels of competency and knowledge up to degree level
- To provide access to a Master's qualification at a partner university
- To provide a route to BCS membership

LEARNER PROGRESSION

Depending on entrance conditions, completing the Level 6 PGD in IT may support entry onto a Master's degree course at selected global universities.



MODULES

ADVANCED DATABASE MANAGEMENT SYSTEMS	
1 Relational theory and concepts	
	Explain theoretical concepts.
	Describe the relational model.
2 Processing database data	
	Describe advanced SQL programming.
	Explain query optimisation.
	Explain concurrency control and transaction management.
	Describe database performance tuning.
	Explain distributed relational systems.
3 Post-relational systems	
	Demonstrate use of object-oriented systems.
	Describe new database management systems.
4 Using standards	
	Explain SQL standards in relation to development.
	Describe the standards for interoperability and integration.
5 Database security	
	Analyse database security methods and techniques.

COMPUTER SERVICES MANAGEMENT

1 Service concept

- Describe the concept of a service.
- Explain customer needs.
- Explain customer satisfaction levels.
- Describe the customer relationship.
- Explain how to achieve operational success.
- Demonstrate use of the capability maturity model (CMM).

2 Organisation

- Explain organisational groups.
- Describe and explain how to deal with customers, users, sponsors and other stakeholders.
- Explain how to plan and execute projects.
- Explain and demonstrate essential administration.

3 Business processes

- Describe the concept of the business process.
- Analyse business process requirements.
- Describe the concept of end-to-end service.
- Explain service features and performance targets.
- Explain the idea of planning and the use of funding and resource in planning.

4 Customer liaison

- Describe the nature of a help desk and its purpose.
- Describe the nature of a service desk and its purpose.
- Explain the use of fault-logging and problem management.
- Explain service features and performance targets.

IT AND THE ENVIRONMENT

1 Legislative and regulatory provisions

Discuss legislative and political issues relating to technology.

2 Remote sensing

Discuss different types of remote sensing.

Discuss the uses of remote sensing.

3 Environmental impact analysis

Critically assess the environmental impact of an activity.

4 Environmental impact of information systems

Discuss the impact of raw material requirements.

Discuss power management.

5 Environmental effects of communication systems

Discuss the methods of balancing environmental costs and communication systems.

6 Information technology in the service of power generation and energy conservation

Discuss the role of IT in optimising energy generation and transmission.

MANAGEMENT INFORMATION SYSTEMS

1 Management within organisations

Explain management activities, roles and levels.

Explain management planning and control systems.

Explain methods of strategic planning in an organisation.

Explain the nature of decision-making.

Explain the nature of information.

Describe the management of MIS.

Describe the measurement of MIS performance.

MANAGEMENT INFORMATION SYSTEMS (CONTINUED)

2 MIS applications and relationships

- Explain Management Reporting Systems (MRS).
- Explain Decision Support Systems (DSS).
- Explain Group Decision Support Systems (GDSS).
- Explain Office Information Systems (OIS).
- Explain management support knowledge-based systems.
- Explain the application of Online Analytical processing.
- Explain data warehouses and data mining facilities.
- Explain the relationships of MIS to other enterprise applications.
- Evaluate IS within functional areas.
- Explain the internet and MIS provisions.

3 Development of MIS

- Analyse the role of strategic planning and strategic IS planning.
- Explain how to manage MIS projects.
- Explain the techniques and methodologies for supporting MIS development.
- Evaluate the use of case tools to aid MIS development.
- Explain the suitability of packages vs bespoke development.
- Explain the implications of end user developments.
- Evaluate outsourcing vs insourcing.

4 Applications

- Explain developments in hardware and software.
- Describe and explain trends in management.
- Explain MIS and mobile computing.
- Explain MIS and social media.

NETWORK INFORMATION SYSTEMS

1 Advantages and disadvantages of distributed processing systems

Explain distributed processing systems.

Explain distributed applications and distributed data.

Describe client/server architecture.

2 Security, data integrity and availability of NIS

Explain the use of back-up.

Explain the security with user access.

Explain how to have security through control.

Explain the place of encryption in security.

Explain the use of security certificates.

Explain the use of digital signatures.

Explain the use of electronic payment systems.

Explain the use of ISO 27001.

3 Operational network/NIS management issues

Explain traffic modelling.

Demonstrate examples of protocols and tools used in network management.

Explain response and performance issues.

4 Human-computer interaction

Explain the need for and requirements of good interface design.

Describe human factors in system design.

5 Local and wide area networks

Evaluate and compare strategic and operational issues with LAN/WAN.

Demonstrate understanding of data protection.

Explain copyright, intellectual property and legislation issues.

NETWORK INFORMATION SYSTEMS (CONTINUED)

6 Local area networks

- Evaluate and compare available architectures in LAN.
- Describe LAN performance issues.
- Analyse bridging vs. routing in LAN.
- Describe cabling infrastructure.
- Explain the use of hubs, switches and bridges in LAN.
- Explain traffic management in LAN.

7 Wide area networks

- Evaluate and compare available architectures in LAN.

8 Messaging and information services

- Explain the use of electronic mail.
- Explain the use of hubs, switches and bridges in LAN.
- Explain protocols for web services.
- Explain website development and management.

PROGRAMMING PARADIGMS

1 The nature of programming languages

- Critically compare imperative and declarative languages.
- Discuss different styles of language.
- Discuss event-driven programming and its use.
- Discuss language standardisation and its use.

2 Programming environments

- Describe the use of compilers and interpreters and how they work.
- Discuss interactive development tools (IDE) and their use.
- Discuss the purpose and use of debugging tools.
- Discuss the purpose and use of testing tools.
- Describe configuration management.

PROGRAMMING PARADIGMS (CONTINUED)

3 Object orientation

Discuss concepts of object-oriented programming.

4 Functional programming

Discuss the concepts in functional programming.

Discuss the concept of side-effects and referential transparency

5 Logic programming

Discuss the concepts in logic programming.

Discuss the use of queries.

Discuss and show understanding of goal reduction.

Discuss negation in logic programming.

6 Related issues

Discuss the term concurrency.

SOFTWARE ENGINEERING 2

1 Analysis and improvement of software processes

Explain and apply software process improvement.

Analyse and show understanding of software life cycle models.

Demonstrate knowledge and awareness of software requirements engineering.

Demonstrate knowledge and awareness of software management.

Demonstrate knowledge and awareness of the evolution of software.

2 Analysis and improvement of software products

Demonstrate awareness of and ability to apply software maintenance methods.

Analyse and explain software architecture and software refactoring.

Evidence knowledge and awareness of software metrics.

SOFTWARE ENGINEERING 2

3 Advanced topics in software engineering

	Evidence knowledge and awareness of the methods and techniques for software reuse.
	Analyse and explain software as a service.
	Demonstrate knowledge and awareness of open-source software engineering practice.
	Demonstrate knowledge and awareness of UML and its use.

SYSTEM DESIGN METHODS

1 Basic elements of system design

	Explain basic system life cycle models.
	Explain and demonstrate use of graphical notations and techniques.
	Explain and demonstrate formal notations.
	Explain the techniques for validation and verification.

2 Constructing a method

	Explain the idea of virtual machine underlying a design method.
	Explain the idea of virtual machine underlying a design method.
	Explain categories of methods.

3 Selecting a method

	Describe technical factors of matching a method to an application.
	Explain non-technical factors suitable for selecting a method.

4 Introducing a method

	Explain how to carry out and evaluate a pilot.
	Explain reverse engineering.
	Describe potential obstacles.

SYSTEM DESIGN METHODS (CONTINUED)

5 Evaluating and tuning

- Explain the statistical process control.
- Describe the use of metrics in the improvement of software development process.
- Describe the relationship between structured and object-oriented methods and software quality assurance.
- Explain how to assess the benefits of introducing a new method.

WEB ENGINEERING

1 Strategies for web development

- Discuss options for hosting strategies.
- Assess server/database replication.
- Evaluate strategies for connecting databases to web applications.

2 Programming for the web

- Evaluate methods of interaction between browser and server.
- Assess ways of controlling access to web resources.
- Discuss how to develop dynamic content.
- Demonstrate the development of dynamic content using PHP or similar dynamic content tools.
- Explain validating user input.

3 XML and CSS

- Demonstrate application of XML.
- Demonstrate how the structure of an XML document can be assessed.

4 Security and privacy

- Assess the typical risks with attacks.
- Discuss the differences between integrity and authentication.
- Demonstrate the ability to assess and deploy both public and private key encryption.
- Explain the use of methods to enhance safety and security.
- Identify attacks and how to protect against them.

WEB ENGINEERING (CONTINUED)

5 Quality

- Evaluate testing approaches.
- Evaluate characteristics of quality.
- Assess the use of metrics in quality.
- Discuss quality of service (QoS).
- Evaluate standards and conformity.

6 Social and ethical issues

- Evaluate the impact of technologies.
- Assess the consequences of media convergence.
- Evaluate the social and economic impact of e-commerce.
- Discuss the ethical and economic implications of accessibility.

7 Emerging technologies and platforms

- Discuss the use of emerging web technologies.
- Evaluate the use of online connectivity.
- Discuss and evaluate the use of social networks.

RESOURCES

[Resources for both centres and self-study students](#) are available on the BCS website.

AVAILABLE RESOURCES

Past assessment papers

On our website, you will find past exam papers for every module to aid revision.

Examiners' reports of past assessments

On our website, you will find exam reports for every module to aid revision.

You can also find the following [support materials](#) on the BCS website:

- Regulations
- General Guidance Notes
- Guidance Notes for the Professional Project in IT
- Submission Guidance for the Professional Project in IT
- Guidance notes for Authenticators
- A list of examination venues in the UK
- A list of examination venues overseas
- Candidate venue instructions
- Examination techniques
- Timetable of examinations



ASSESSMENT

The assessment for the BCS Level 6 Professional Graduate Diploma in IT is a three-hour written examination for each module taken, apart from the Professional Project (please see below for more details). Examinations are taken under exam conditions. Candidates will choose three questions from a choice of five, with equal marks for each. The pass mark for each of the compulsory modules is 40%.

REASONABLE ADJUSTMENTS

BCS seeks to provide equal Access to Assessment for all students, ensuring that there are no unnecessary barriers to assessment and that any reasonable adjustments for students preserve the validity, reliability and integrity of the qualification.

All assessment will be through the medium of English and consideration will be given to requests from BCS approved Centre's for reasonable adjustments to be approved for a student. The decision will be based on the individual needs of the student as assessed by suitably qualified professionals. In promoting this policy, BCS aims to ensure that any student is not disadvantaged in relation to other students and their award accurately reflects their attainment.

For further information about our [access to assessment policy](#) can be found on the BCS website.

PROFESSIONAL PROJECT

The Professional Project should involve the development of a computer- based solution to a practical problem. The report must put the problem in context, include a survey of relevant literature, and provide a list of references.

The Professional Project should be an individual piece of work undertaken by the student alone. Group projects are not allowed. The size of the report should be approximately 10,000 words excluding appendices and be submitted with an authentication form.

EXEMPTIONS

All students are eligible for exemptions. Normally a student will start at Certificate level and progress through each level in succession. However, in some circumstances exemptions are offered that allow students to omit certain units (up to 50% of the total number of units) with exception of the Professional Project at Level 5 and Level 6.

There are several vocational and professional qualifications that may enable students to gain entry at a higher point in the HEQ program, or to gain automatic exemptions in specific units. BCS allows two routes to exemption for HEQ:

- Accreditation of Prior Learning (APL)
- Individual Exemption

A list of qualifications approved under the APL scheme is maintained by BCS and is available on request. The qualifications included in the APL list have been subject to a detailed review and approved by the BCS to ensure that the qualifications are at a suitable level and contain suitable content for exemption to be granted.

Exemption will be granted only based on the qualifications approved, if the qualification has been completed, passed and sufficient and appropriate evidence has been supplied to BCS.

In certain circumstances BCS may grant individual exemptions based on other qualifications and experience not listed in the APL scheme. An individual exemption is granted solely at the discretion of BCS on a case by case basis.

LEARNING DELIVERY

HEQ IT qualifications are delivered through approved Centres and through self-study. There are two levels of approved Centres, Approved and Accredited. Details of both [Approved Centres and Accredited Centres](#) can be found on the BCS website.

APPROVED PROVIDER

A course provider becomes an approved provider (Centre) when a successful review has been completed by BCS. At this level, BCS is concerned only with the course provider's ability to deliver the course satisfactorily, based on documentary evidence.

An approved Centre may only be approved to deliver certain level and units based on their choice and their ability to do so.

ACCREDITED PROVIDER

An Accredited Provider (Centre) is one that has undergone further scrutiny to review teaching methods, course structure and soundness of the business.

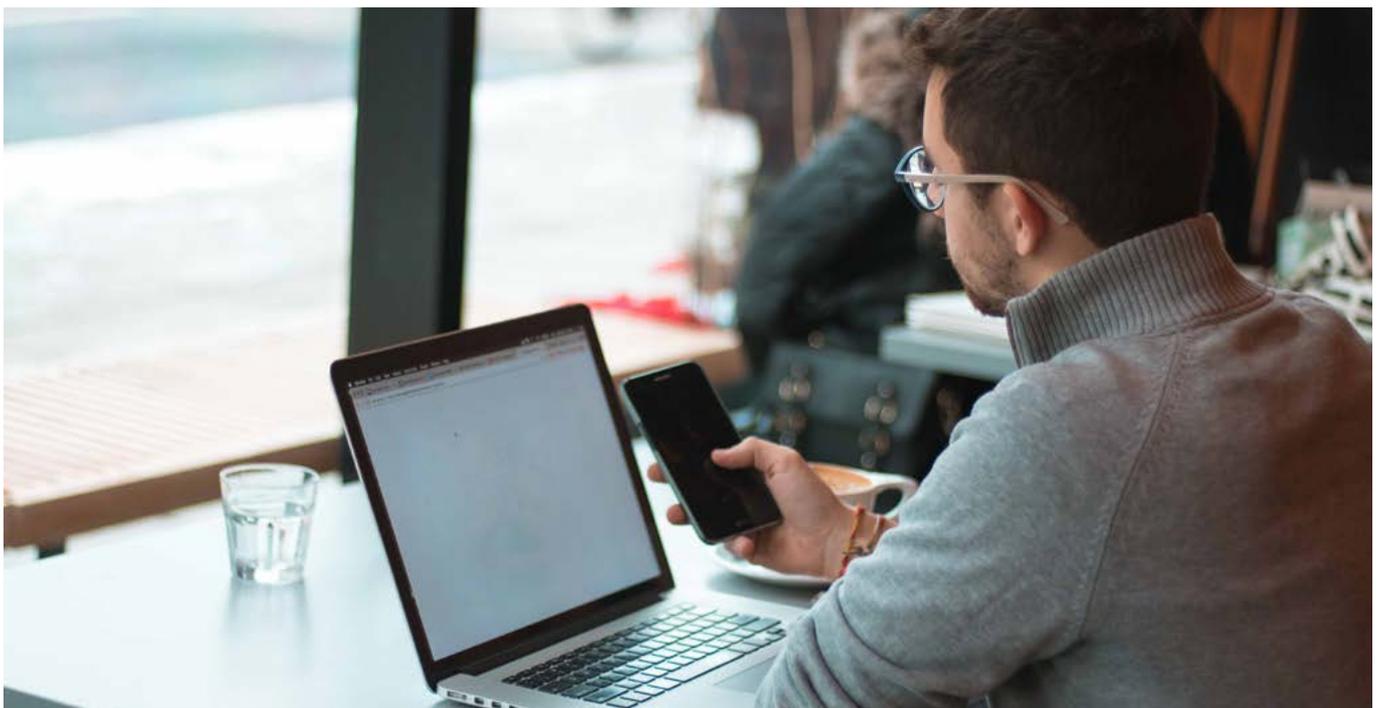
SELF STUDY

All students have the option to take HEQ Examinations based on a course of self-study. Limited support is available from BCS for students undertaking this method of learning.

COURSE MATERIAL

Course Material is supplied by the Centre. The syllabus and a unit description with a recommended reading list are provided on the BCS website. Much of the reading material is available directly from the BCS book supply service.

Past examination papers with model answers and examiners comments are available to student members and Course Providers.



APPEALS

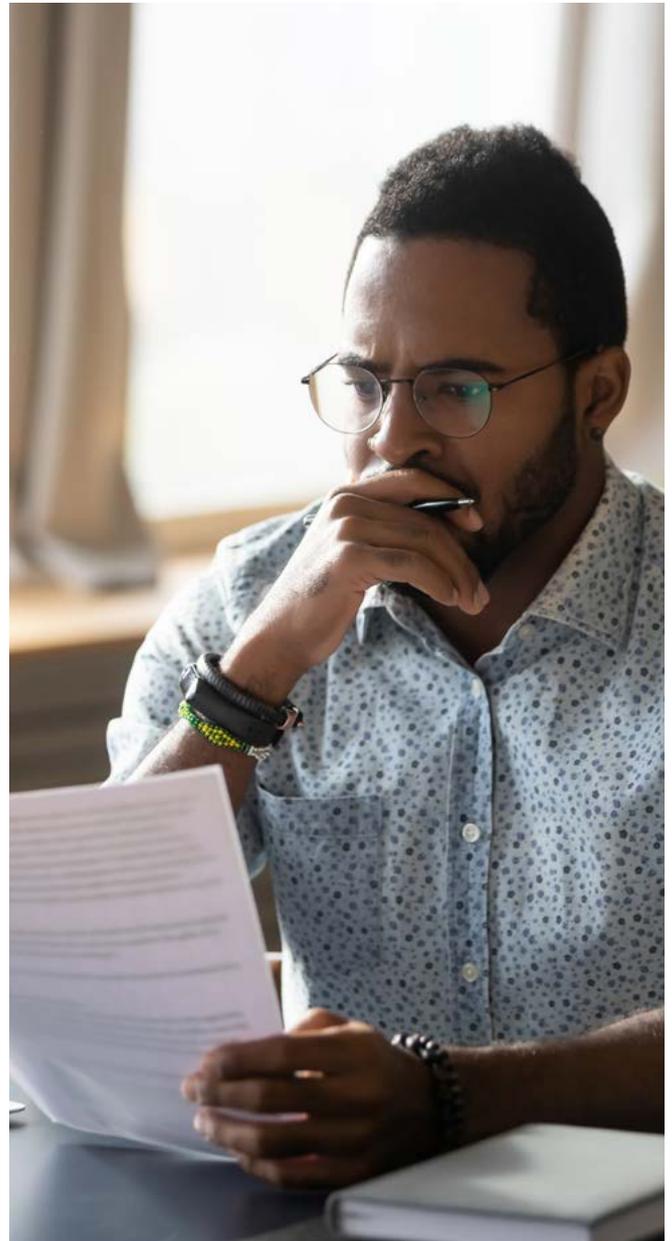
If situations arise that call into the question the validity of an awarding decision, for example, via an appeal or an enquiry in accordance with our Appeals Policy, or an error has been made and a learner has incorrectly been awarded, or not awarded, a qualification achievement issue will be brought to the attention of the Service Delivery Manager.

Appeals by learners are also dealt with by the Service Delivery Manager who will then be responsible for amending the relevant learner's record (and/or the records of groups of learners if the investigation indicates the issue affects more than one learner) to reflect the new award or indicate that an earlier award has been withdrawn/amended.

The Service Delivery Manager is also responsible for altering marks/awards if it is found there were an error and/or material inconsistency in the assessment's arrangements assigned to a question, test, or qualification.

The Service Delivery Manager will then be responsible for ensuring that the relevant learner(s) and centre(s) are informed of the revised awarding decision and the decision to revoke the certificates (if they have been issued already) in accordance with our stated Appeals and/or Malpractice and Maladministration Policies.

BCS will then carry out, as stated in our Appeals policy, a review across other learners/centres to see if they too were affected by the same original decision/error.



FREQUENTLY ASKED QUESTIONS

Q) When are exams held?

A) The examinations are held twice a year and are undertaken in normal examination conditions with one or more duly appointed invigilators. Exam Centre locations are not fixed and are at the discretion of BCS. BCS will endeavour to locate examinations at standard examination centres. A list of standard examination centres in the UK and overseas is available on the BCS website. Occasionally it may be necessary to book a special exam venue; in this case, a surcharge will be payable to BCS. Find out more about [registering to take an HEQ exam](#) on the BCS website.

Q) What is GLH and TQT?

A) Guided Learning Hours (GLH) indicates the approximate time (in hours) that the learner will be supervised during any teaching, learning or assessment activities.

Total Qualification Time (TQT) is a predication of the total time a learner with no prior knowledge might need to complete the course.

TQT is made up of two elements: GLH, and all other hours (an estimate of the number of hours a learner will reasonably spend on any unsupervised learning or assessment activities including homework, research, exam preparation and formal assessment) so that they can successfully achieve the qualification.

Q) What learning materials and courseware are available?

A) Past papers and examiners' reports are available on the BCS website for candidates to use. Browse our [collection of past papers and exam reports](#) for all modules, or [visit the HEQ pages](#) for more information on support materials.

Q) Can HEQ be delivered remotely?

A) HEQ candidates can study for BCS Level 4 Certificate, Level 5 Diploma, or Level 6 Professional Graduate Diploma qualifications independently, as self-study candidates. BCS provides some support to self-study candidates.

Candidates can also register to study our qualifications with centres around the world. [Learn more about finding an approved training centre](#) on the BCS website.

GLOSSARY

BCS, The Chartered Institute for IT	The organisation has several levels of membership. It represents the IT profession as a group to Government and other institutions. It promotes professionalism and continuous development to its membership.
Ofqual	The regulator of general and vocational qualifications in England and vocational qualifications in Northern Ireland. Responsible for maintaining standards, improving confidence and distributing information about qualifications and examinations.
Regulated Qualifications Framework (RQF)	The RQF helps students to make informed decisions about the qualifications they need. They can compare the levels of different qualifications and identify clear progression routes for their chosen career.
SFIPlus	A BCS proprietary extension of an industry initiative Skills Framework for the Information Age (SFIA), a model for describing and managing competencies for ICT professionals. The SFIA is maintained by the SFIA Foundation.
Tertiary and Vocational Education Commission (TVEC)	Part of Sri Lanka's Ministry of Skills Development and Vocational Training.



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