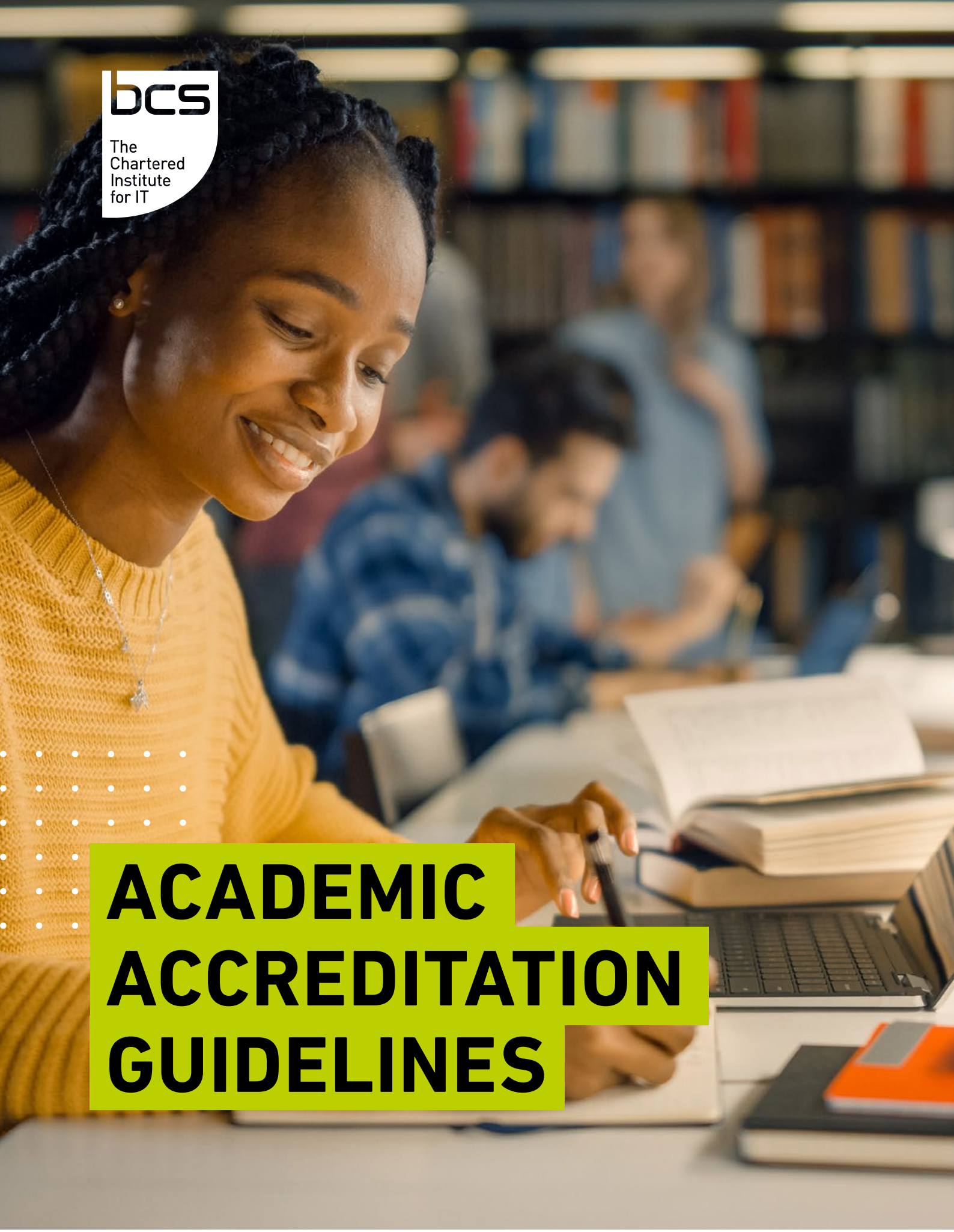

ACADEMIC ACCREDITATION GUIDELINES

April 2022

CONTENTS

1 OVERVIEW OF ACCREDITATION

1.1 INTRODUCTION

These Guidelines describe the approach and content that BCS, The Chartered Institute for IT, would expect to find in programmes put forward for accreditation.

BCS, under its Royal Charter, is required to establish and maintain standards of competence, conduct and ethical practice for information systems professionals. This includes the responsibility to develop and maintain standards for the educational foundation appropriate to people wishing to follow a career in information systems.

BCS became a licensed body of the Engineering Council in 1990. The BCS Chartered IT Professional standard was introduced in 2004 and the BCS Registered IT Technician (RITTech) standard was added in November 2015.

In 2008, BCS became a founding signatory to the Seoul Accord with the primary purpose of contributing to the improvement of computing education worldwide, through the mutual recognition of accredited academic computing programmes that prepare graduates for professional practice. This directly benefits graduates of accredited degrees as these will automatically be recognised by all the other signatories including, ABET (USA), the Australian Computer Society and the Canadian Information Processing Society. This signatory status also ensures the BCS accreditation process is aligned to international standards.

In addition, BCS is a member organisation of the European Quality Assurance Network for Informatics Education (EQANIE). The objectives of EQANIE in accreditation and quality assessment include facilitating mutual transnational recognition of programmes, increasing mobility of graduates, and providing an appropriate European label for accredited educational programmes.

BCS undertakes a programme of visits to Higher Education Institutions (HEIs) and other higher education providers to consider programmes for accreditation leading to CITP, CEng, IEng and/or RITTech status. BCS actively encourages both UK and non-UK HEIs (subject to local in jurisdiction bodies) to seek accreditation. Whilst accreditation is based on UK standards, BCS welcomes diversity and works closely with HEIs to clarify how standards meet local needs. BCS encourages non-UK HEIs to liaise with the Academic Accreditation team (educ@bcs.uk) in seeking any such clarifications.

BCS believes that preparation for a role as an information systems professional requires a sound theoretical understanding and practical experience. It also believes that students must gain a full appreciation of the wider issues of ethical standards, legislative compliance, and the social and economic implications of information systems practice. Therefore, in considering programmes for accreditation, BCS looks for programme content which specifically aims to assist students in gaining a sound academic grounding in the discipline and an understanding of the professional issues relevant to their future working lives.

The following documents inform these Guidelines:

BCS standard for CITP

UK Standard for Professional Engineering Competence (UK-SPEC) is the Engineering Council policy statement for the formation of CEng and IEng.

Accreditation of Higher Education Programmes (AHEP)

BCS standard for RITTech

Seoul Accord Graduate Attributes

Euro-Inf Framework Standards and Accreditation Criteria

1.2 SCOPE

The variety and range of ways in which computer systems and related computer communications are deployed grows daily. It is now commonplace to read about systems which:

- underpin all aspects of business, administration and frequently areas such as management, education, health, forensics, and security
- feature as embedded systems or information systems in engineering devices and applications, often involving some element of criticality e.g., involving safety or security
- are used in furthering discovery in other disciplines, e.g., through biologically inspired computing, e-science, or grid computing

In many of these situations the presence of computing is vital to the extent that the enterprise is dependent on the computing provision and could not function without it. Through these various contributions and through developments in technology itself, many of the recent advances in engineering and other areas are attributed to computing. In the future, these trends are likely to proceed with even greater speed and subsequently greater impact.

To properly underpin all these endeavours, it is important to have personnel who truly understand the principles associated with building and maintaining high quality systems – the key characteristic attributes being usable, reliable, secure, safe, dependable as well as being easy to test, maintain, manage, and so on. For those wishing to build systems that are truly useful, it is often vital to have an understanding of aspects of the domain of use. Acquiring that insight may involve a deep understanding of the application domain and this may involve considerable study; as applications become more sophisticated, this will be even more important.

To design, construct, deploy, manage, and maintain such systems effectively and efficiently demands a deep understanding of the relevant principles in the specific context of computer-based systems. The inherent nature of such systems normally calls for an approach to design that is based on the application of engineering principles, founded on appropriate scientific and technological insights. It also implies an appreciation of the concept of risk, knowledge of how to manage risk, and an understanding of how people interact with computer systems, often in the presence of human frailty. Further, it includes the use of standards and attention to a range of issues incorporated in the BCS Code of Conduct which is periodically reviewed in the light of experience.

1.3 SCOPE OF THE CURRICULUM

BCS supports the Computing Benchmark statements established by the UK Quality Assurance Agency for Higher Education (QAA) in that they are broad statements about standards for the award of honours and masters degrees in the computing area and embrace the BCS definitions above.

The Subject Benchmark Statement for Computing defines a conceptual framework that gives computing its coherence and identity; it is about the intellectual capability and understanding that should be developed through the study of computing, the techniques and skills which are associated with developing an understanding of computing, and the level and intellectual demand and challenge which are appropriate. As such it forms an excellent framework which BCS and higher education can use to support the accreditation process.

Programmes being put forward for accreditation should ensure that there is significant study and learning outcomes as set out in the benchmark. Evidence will be required showing that the principles of programme design have been followed. As informed by the BCS Code of Conduct, it is expected that students are exposed to, and developed in, both professional and ethical outlook and practice.

For RITTech, the accreditation does not directly assess the scope of the curriculum. The programme of study is important in that it should be grounded in computing, and it must provide the underpinning knowledge required by the students to be employed in the IT profession.

1.4 PROGRAMME STRUCTURES

Within UK higher education, each course or module that contributes to a degree/diploma programme carries a number of credit points and its learning outcomes are assigned to a level. The QAA publishes a qualification framework for England, Wales, and Northern Ireland; in Scotland, the corresponding framework is the Scottish Credit and Qualifications Framework (SCQF). Both define 120 credit points as equivalent to one full-time academic year of undergraduate study and 180 credit points as equivalent to a yearlong full-time masters programme. In the QAA framework, a foundation degree is seen as containing 240 credit points, an ordinary degree as containing 300 credit points, an honours degree as containing 360 credit points, an integrated masters as containing 480 credit points and an MSc as containing 180 credit points. The QAA frameworks assign levels 4, 5 and 6 to years 1, 2 and 3 of study in an undergraduate programme and level 7 to postgraduate study.

In Scotland, where entry to tertiary education can be after only five years of secondary education, undergraduate degree programmes typically require an additional 120 credit points over and above the credit point requirements for elsewhere in the UK. In addition, the SCQF credit levels differ from those used in England, Wales, and Northern Ireland. Levels 7 and 8 in Scotland correspond to levels 4 and 5 in the rest of the UK. The junior honours are at SCQF level 9 or 10 and final year honours courses are at SCQF level 10. Masters degrees are at SCQF level 11. Thus, normally, an honours degree in Scotland requires 480 points (with a minimum of 120 at level 10 and a further 120 at level 9 or 10) and an integrated masters 600 credit points (with a minimum of 120 at level 11), whilst an ordinary/pass degree requires 360 points (with a minimum of 60 at level 9).

Throughout much of Europe, credit points are expressed as ECTS ("European Credit Transfer and Accumulation System") credits, where one ECTS credit is equivalent to two UK credit points, and 60 ECTS credits represent an academic year. The Framework for Qualifications of the European Higher Education Area (QF-EHEA) further refers to Bachelors degrees as "first cycle" and Masters (both MSc and MEng) as "second cycle." The concept of an "Honours" degree is not always understood outside the UK, but a Bachelors degree would normally be at the level of a UK Honours degree, although the number of ECTS credits required varies between 180 and 240, depending on (for example) the individual country's school system. In some other countries in the world ECTS and QF-EHEA, or systems aligned to them, have been adopted at the national level. Where a programme includes an industrial placement, the module can be accredited separately to allow students to join the RITTech register without further assessment. The period of industrial placement must be an assessed part of the overall programme and will be expected to be undertaken as a single block (one year). The evaluation must include assessment of the competence of the student in employment against the criteria set out in the RITTech standard.

Degree Apprenticeship and Foundation Degree programmes can also be accredited for RITTech. Students must be in employment using skills defined by BCS as within the scope of the IT Profession[1] throughout the programme and assessment of their competence in employment must be evaluated against the criteria set out in the RITTech standard.

Where applications are made from outside of the UK, BCS will seek to ensure a programme's UK equivalence before commencing the accreditation process.

1 Exploiting IT for business benefit in any context demonstrated by using skills included in a recognised skills framework such as the Skills Framework for the Information Age (SFIA www.sfia.org.uk) or the European Competence Framework (e-CF www.ecompetences.eu/)

1.5 ACCREDITATION

BCS can consider accreditation of programmes of study for the following:

- Chartered IT Professional (CITP)
- Chartered Engineer (CEng)
- Incorporated Engineer (IEng)

The exemplifying academic qualification for CITP is an accredited honours degree in the computing field.

The exemplifying academic qualifications for CEng is one of the following:

- An accredited Bachelors degree, with honours in engineering or technology plus an accredited specialist masters degree, or appropriate further learning to masters level
- An accredited integrated masters degree.
- The exemplifying academic qualifications for IEng is one of the following:
- An accredited Bachelors or honours degree in engineering or technology
- An accredited foundation degree in engineering or technology, plus appropriate further learning to degree level.

The term 'accredited as partially meeting the educational requirement for CITP/CEng/IEng registration' indicates that a programme is accredited as contributing to the academic requirement for the relevant registration.

BCS can consider the following for accreditation for Registered IT Technician (RITTech):

- Degree Apprenticeship and Foundation Degree programmes where students follow a programme of work-based learning.
- Industrial placement modules

Some programmes may meet the requirements for more than one of the above. Any programme which is put forward for accreditation must meet the relevant programme criteria, as well as being developed and delivered in an environment which meets the criteria as detailed in Appendix 2. In addition to meeting the criteria, no more than one-third of the material in an accredited undergraduate programme may normally lie outside the scope of the QAA Computing Benchmark as summarised in table 1.5. Programmes that do include more than one-third of their material from other disciplines may nevertheless be accreditable, provided that this material is integrated into the programme in support of the computing outcomes and that this is demonstrated by the mapping of the core modules.

Programme type	Minimum computing credit points (including project) [Minimum project credits/level]	Notes	Accreditation
Foundation degree	160 of which a minimum of 80 are at level 5* [Project: 20 credits at level 5]	The programme should provide breadth in the area of computing	Accredited as partially meeting the underpinning knowledge and understanding requirement for IEng
Joint honours degree	160 of which a minimum of 80 are at level 5* [Project: 30 credits at level 6]	The programme should provide breadth in the area of computing	Accredited as partially meeting the underpinning knowledge and understanding requirement for CITP
Ordinary degree	200 of which a minimum of 40 are at level 6* [Project: 20 credits at level 5 or above]	The programme should provide breadth in the area of computing	Accredited as fully meeting the underpinning knowledge and understanding requirement for IEng
Honours degree	240 of which a minimum of 80 are at level 6* [Project: 30 credits at level 6]	The programme should provide breadth and depth in the area of computing	Accredited as fully meeting the underpinning knowledge and understanding requirement for CITP and partially meeting the requirements for CEng
Specialist masters degree	120 at level 7* [Project: 60 credits at level 7]	The programme should provide in-depth study of at least one specialist area of computing and build on the equivalent of an honours degree	Accredited as partially meeting the underpinning knowledge and understanding requirement for CITP and the further learning requirement for CEng
Generalist masters degree	180 credits at level 6* or above† [Project: 30 credits at level 6 or above]	The programme should provide breadth in the area of computing	Accredited as partially meeting the underpinning knowledge and understanding requirement for CITP
Joint integrated masters degree	240 of which 80 are at levels 6/7 [Project: 30 credits at level 6 or 7]	The programme should provide breadth and depth in the area of computing	Accredited as fully meeting the underpinning knowledge and understanding requirement for CITP
Integrated masters degree	320 of which a minimum of 60 are at level 7* (for CITP: a minimum of 80 are at levels 6/7) [Project: 30 credits at level 6 or above]	The programme should provide breadth and depth in the area of computing. In addition, it should provide in-depth study of at least one specialist area of computing	Accredited as fully meeting the underpinning knowledge and understanding requirement for CITP and CEng

***NOTE:** The differences in the minimum computing points between the England, Wales and Northern Ireland requirements and the Scottish requirements are detailed in Section 1.4 on page 5.

A programme will not normally be considered for an alternative level of accreditation than that outlined in the table.

The requirement for RITTech is demonstration of competence in employment:

- For Degree Apprenticeship and Foundation Degree programmes, there must be a formal assessment of competence. The timing of that assessment during a Degree Apprenticeship programme may be at the discretion of the HEI
- For industrial placements, the period of placement will be expected to be undertaken in a single block (one year) and be a formally assessed part of the overall programme of study.

Accreditation for RITTech status means remitting the need for further assessment of competence for registration.

Programme type	Minimum requirements	Notes	Accreditation
Industrial placement, Degree Apprenticeship, Foundation Degree	Individuals must have been employed in an IT role and the placement/employment must contribute to the overall assessment of the programme	The institutions assessment processes must evidence assessment against the competence criteria set out in the BCS standard for Registered IT Technician status	Accredited as meeting the competence requirements for RITTech

2 ACCREDITATION REQUIREMENTS

In conducting the accreditation process for programmes, BCS looks at a range of issues which relate to the department in which the programmes are delivered as well as a range of programme-specific issues. Appendix 2 identifies these requirements.

Programmes may be at bachelors level, with or without honours, at integrated, specialist, or generalist masters level; distinct accreditation advice applies to each of these. Programmes (usually described by a programme specification as accepted by the UK QAA) accredited for CITP and CEng are expected to meet the requirements set out in the **QAA Subject Benchmark Statement: Computing.** The Engineering Council's outcomes for IEng apply for ordinary degrees seeking accreditation for IEng along with foundation degrees which will be reviewed in partial fulfilment. The assessment criteria set out in the BCS Registered IT Technician standard applies to industrial placements, Degree Apprenticeships and Foundation Degree programmes accredited for RITTech.

When considering accreditation, BCS seeks evidence that:

- the programme is up to date and conveys a sense of enthusiasm for the subject
- programme design and review are based on the appropriate computing benchmark document
- departmental reviews undertaken by the HEI base their findings on the relevant benchmark and involve external experts in the field
- external examiners are using the benchmark in making their judgement
- the programme learning outcomes suitably reflect the abilities and skills defined in the appropriate benchmark
- all programmes contain sufficient computing content, as set out in the table on page 7.

2.1 QUALITY ASSURANCE AND ENHANCEMENT

The quality of a programme depends not only on its content, syllabuses, and assessment, but also on the environment in which it is developed, implemented, and improved.

BCS requires evidence of a clear quality assurance framework at departmental and institutional level, and where appropriate, at inter-institutional level. Evidence is also required that this framework is in active use and that it involves the participation of students; such evidence could take the form of output from reviews of the department and/or departmental mechanisms for capturing feedback from students.

BCS requires evidence that the students on the programme are supported by appropriate learning resources which include academic, administrative, and technical staff, computing and communication facilities which include appropriate software tools, and specific and general learning facilities including access to appropriate digital and print-based information and effective academic advice and guidance. In addition, BCS requires evidence that employability skills are developed throughout the course of study and students are supported in their professional development.

HEIs are required to specify in the application form the maximum length of time permitted for completion of programme(s). The maximum period for completion is normally six years (and eight years in the case of Integrated Masters programmes) to ensure currency; however, HEIs wishing to request accreditation of a programme with a duration of more than the maximum period can provide a rationale to BCS which will be considered on a case-by-case basis. Where programmes do not meet this requirement, or the HEI has decided not to make a case for it to be waived, the accreditation may be granted with a condition on the length of study.

Many UK university examination board rules include some allowance for compensation or condonement of limited failure in one or more modules where this is compensated by a stronger performance across the programme as a whole. BCS has adopted Engineering Council definitions, however, it is understood that different terminology may be used by an HEI. For clarity:

The Engineering Council defines **compensation** as: "The practice of allowing marginal failure (i.e., not more than ten percentage points below the nominal pass mark) of one or more modules, often on the basis of good overall academic performance."

The Engineering Council defines **condonement** as: "The practice of allowing students to fail one or more module(s) with a fail mark of more than ten percentage points below the nominal pass mark yet still qualify for the award of the degree."

For CITP accreditation, where compensation and/or condonement is permitted under HEI regulations, BCS must be assured that the overall learning outcomes of the programme and teaching and assessment of accreditation criteria are not undermined.

The Engineering Council policy on compensation and condonement in the consideration of the accreditation of undergraduate and postgraduate engineering degree programmes for CEng and IEng can be found in Appendix 3.

HEIs are required to notify BCS if, during an accreditation period, there are significant changes to accredited programmes or the learning environment in which they are delivered, to the Quality Assurance system, the compensation and condonement regulations, or to learning support.

2.2 BCS ACCREDITATION CRITERIA AND AHEP LEARNING OUTCOMES

A programme must deliver and assess all BCS accreditation criteria and AHEP Learning Outcomes for the accreditation sought. These represent the competencies demanded of graduates to complete the educational base for professional registration as a Chartered IT Professional, a Chartered or Incorporated Engineer.

Undergraduate honours level programmes can be considered for Full CITP or Full CITP and Partial CEng. Integrated masters programmes can be considered for Full CITP or Full CITP and Full CEng.

Postgraduate, both generalist and specialist MSc programmes can be considered for Partial CITP, or for specialist MSc programmes, Partial CITP and Partial CEng (Further Learning).

2.3 CITP ACCREDITATION REQUIREMENTS

Criteria should only be indicated where they can be guaranteed to be covered and assessed by every student.

Accreditation criteria are grouped into three areas, Computing-related cognitive abilities, Computing related practical abilities, and transferable skills.

The following terms are used with the meaning stated:

Awareness is general familiarity, albeit bounded by the needs of the specific discipline.

Knowledge is information that can be recalled.

Understanding is the capacity to use concepts creatively, for example in problem solving, in design, in explanations and in diagnosis.

Skills are acquired and learned attributes which can be applied almost automatically.

The extent to which students acquire these abilities will depend on the emphasis of individual programmes.

In examining programme design, HEI regulations and student achievement, BCS seeks to ensure that the benchmark outcomes are not compromised, e.g., where compensation is permitted under HEI regulations, BCS may require that certain modules cannot be compensated (see 2.1).

2.3.1 Requirements for undergraduate and integrated masters programmes

Undergraduate honours level and integrated masters programmes will be considered for Full CITP accreditation.

The programme content must satisfy the criteria within each of the three areas, consistent with the title and scope of the degree programme (Appendix 2).

2.3.2 Requirements for postgraduate programmes

BCS recognises that there is a variety of postgraduate programmes in computing, specialist MSc programmes that build on the knowledge and understanding developed in undergraduate programmes in computing and generalist MSc programmes that offer an opportunity for graduates from other disciplines. Specialist masters programmes are characterised by the fact that they involve deep study of computing by building on:

- prior study of some aspect of computing itself, or
- another discipline which provides important underpinning for, or insight into, the discipline of IT/computing, or
- an application domain where there are important benefits that flow from a close marriage with computing

Specialist masters programmes will be considered for accreditation for Partial CITP. Programmes seeking partial CITP must build upon the foundations of computing at undergraduate level, including current professional issues and techniques.

Generalist masters programmes will be considered Partial CITP accreditation, to ensure parity with joint honours programmes. They will need to include an acceptable project worth at least 30 credits at undergraduate honours level or higher.

It is accepted that in practice the generalist masters project is invariably worth at least 60 credits, leaving 120 credits of taught material. The parity with joint honours programmes (160 credits in total, at least 30 for the project) is well established, with a typical generalist masters programme having a total of 180 credits, 60 credits of which are associated with the project.

Given the level of accreditation considered, graduates' abilities for generalist masters programmes are assessed against those listed for undergraduate honours degree requirements (Appendix 2).

2.4 CENG AND IENG ACCREDITATION REQUIREMENTS

A programme must deliver and assess all the learning outcomes to achieve accreditation. Learning outcomes should only be indicated where they can be guaranteed to be covered by every student.

AHEP introduces definitions for 'complex problems' (CEng) and 'broadly defined problems' (IEng) to differentiate between the levels of learning required in the educational base for registration.

The definitions are:

Broadly defined problems involve a variety of factors which may impose conflicting constraints but can be solved by the application of engineering science and well-proven analysis techniques.

Complex problems have no obvious solution and may involve wide-ranging or conflicting technical issues and/or user needs that can be addressed through creativity and the resourceful application of engineering science.

Learning outcomes are grouped around five specific areas of learning, which reference the generic statements of competence in UK-SPEC. These five areas are:

1. Science and Mathematics
2. Engineering Analysis
3. Design and Innovation
4. The Engineer and Society
5. Engineering Practice

The programme content must satisfy the learning outcomes for each of the five areas, consistent with the title and scope of the degree programme (Appendix 2).

2.5 MAJOR PROJECTS

Project modules are considered an essential element of a degree accredited by BCS. Projects provide an ideal opportunity for students to draw together their learning throughout their degree. It will be expected that the programme design offers adequate preparation for students throughout the earlier levels of study. Accreditation criteria and AHEP Learning Outcomes should not be mapped to project modules unless they are assessed for every student.

Projects must include the students undertaking practical work of some sort using computing/IT technology. This is most frequently achieved by the creation of an artefact as the focus for covering all or part of an implementation lifecycle. Dissertations based solely on literature review activity and/or user/market surveys are not acceptable.

Students must be provided with written guidance on all aspects of the project, including selection, conduct, supervision, milestones, format, and criteria for assessment.

Projects must involve the production of a report which should include:

- elucidation of the problem and the objectives of the project
- an in-depth investigation of the context and literature, and where appropriate, other similar products (this section is likely to be emphasised less for an IEng project)
- where appropriate, a clear description of the stages of the life cycle undertaken
- where appropriate, a description of how verification and validation were applied at these stages
- where appropriate, a description of the use of tools to support the development process
- a critical appraisal of the project, indicating the rationale for any design/implementation decisions, lessons learnt during the course of the project, and evaluation (with hindsight) of the project outcome and the process of its production (including a review of the plan and any deviations from it)
- a description of any research hypothesis
- in the event that the individual work is part of a group enterprise, a clear indication of the part played by the author in achieving the goals of the project and its effectiveness
- references

Projects must be passed without compensation.

2.5.1 Undergraduate projects

It is expected that within an undergraduate programme, students will undertake a major computing project, normally in their final year and normally as an individual activity, giving them the opportunity to demonstrate:

- their ability to apply practical and analytical skills present in the programme as a whole
- innovation and/or creativity
- synthesis of information, ideas, and practices to provide a quality solution together with an evaluation of that solution
- that their project meets a real need in a wider context
- the ability to self-manage a significant piece of work
- critical self-evaluation of the process

In the event of this major activity being undertaken as part of a group enterprise, there is a requirement that the assessment is such that the individual contribution of each student is measured against all the above learning outcomes.

For accreditation for CITP or CEng, the individual project should be worth at least 30 credit points at level 6 or above. The project must be passed without compensation.

For accreditation for IEng the individual project should be worth at least 20 credit points at level 5 or above.

2.5.2 Postgraduate projects

Projects at postgraduate level may be similar in scope to undergraduate projects but should reflect the ethos of advanced study and scholarship appropriate to a masters degree (whether generalist or specialist).

Postgraduate projects must give students the opportunity to demonstrate:

- a systematic understanding of knowledge, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of the specialist academic discipline
- a comprehensive understanding of techniques applicable to their own research or advanced scholarship
- originality in the application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline
- deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences
- demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level
- critical self-evaluation of the process

Generalist masters programme projects should be worth at least 30 credit points and be at least at undergraduate honours level. It is recognised that in practice a project on a masters programme is usually worth at least 60 credits at Level 7.

2.5.3 Group Projects

An Integrated Masters degree must include a major group project, commonly delivered at Level 6 or 7, and must form a significant component of the degree.

The project assessment would typically be made up of several elements such as a group mark, an individual mark, and peer review. The marks each student receives must reflect their individual achievement and input on this project.

2.6 ZERO CREDIT MODULES

HEIs will occasionally make use of modules which have a credit value of zero to meet BCS accreditation requirements. It is important that modules which are additional to the total credit value of a programme do not place undue burden on students. To be considered as addressing accreditation requirements, modules must be credit bearing or have an assessed element which is taken into account in progression or award decisions.

2.7 REGISTERED INFORMATION TECHNOLOGY TECHNICIAN

BCS is the owner and regulator for the Registered IT Technician (RITTech) standard. The Institute sets the standard and maintains and publishes the Register of IT Technicians.

To be included in the register of Registered IT Technician an individual must:

- demonstrate competence using skills defined by BCS as within the scope of the IT Profession
- be a member of a professional body licensed by BCS to award Registered IT Technician status and have agreed to abide by the body's code of conduct which is subject to disciplinary procedures
- undertake to maintain and develop their IT knowledge and skills in the IT profession by keeping a record of professional development.

2.7.1 Requirements for RITTech

The assessment procedure carried out by the HEI to determine the successful or unsuccessful completion of Industrial Placement modules, Degree Apprenticeship and Foundation Degree programmes, must provide assurance that successful students have reached the minimum standard of experience and responsibility, competence, and interpersonal skills to meet the criteria set out in the BCS standard for Registration as an IT Technician. The timing of the assessment of students undertaking Degree Apprenticeship programmes may be at the discretion of the HEI.

Details of the assessment procedure need to be mapped to the competence criteria, including:

- a clear statement of learning and development (L&D) outcomes (target competencies)
- identifying how the assessment process assures the criteria for autonomy, influence, complexity, and business skills have been met
- describing how the assessment process confirms technical competence in one or more role families listed in the RITTech standard
- the assessors' competence and capability for the role of assessment of achievement
- arrangements for quality assurance and moderation of outcomes

The HEI must undertake to find a suitable mechanism by which to formally document, for each student, that a completed Industrial Placement or assessment as part of a Degree Apprenticeship or Foundation Degree programme has reached the BCS standard and the date by which the assessment was completed.

2.7.2 The RITTech standard

The requirements for accreditation are based on the standard for Registered IT Technician, set and maintained by BCS, the Chartered Institute for IT.

Registration validates:

- knowledge and experience gained through formal and informal education and training
- the ability to contribute to the design, development, manufacture, construction, commissioning, operation or maintenance of IT products, equipment, processes, systems, or services
- commitment to Professional standards.
- To be included in the register of Registered IT Technicians, as individual must:
- demonstrate confidence using skills defined by BCS as within scope of the IT Profession[2];
- arrangements for quality assurance and moderation of outcomes
- be a member of a professional body licensed by BCS to award Registered IT Technician status and have agreed to abide by the body's code of conduct which is subject to disciplinary procedures.
- undertake to maintain and develop their knowledge and skills in the IT profession by keeping a record of professional development.

2 Exploiting IT for business benefit in any context demonstrated by using skills included in a recognised skills framework such as the Skills Framework for the Information Age (SFIA www.sfia.org.uk) or the European Competence Framework (e-CF www.ecompetences.eu/)

To accredit an institution's assessment of the industrial placement/degree apprenticeship, the Department will be required to:

- demonstrate the ability to assess the experience, responsibility, competence, and interpersonal skills of individuals
- provide evidence that the assessment process tests each individual's:
- experience and responsibility and interpersonal skills against the competence descriptors for Autonomy, Influence, Complexity and Business Skills
- technical competence to the required level in one or more role families in the RITTech standard

Autonomy

A1 Works under general direction; uses discretion in identifying and responding to complex issues and assignments.

A2 Determines when issues should be escalated to a higher level.

Influence

B1 Interacts with and influences colleagues.

B2 Has working level contact with customers, suppliers, and partners (internal or external).

B3 In predictable and structured areas may supervise others.

B4 Makes decisions which may impact on the work assigned to individuals or phases of projects.

Complexity

C1 Performs a broad range of work, sometimes complex and non-routine, in a variety of environments.

C2 Applies methodical approach to issue definition and resolution.

Business Skills

D1 Understands and uses appropriate methods, tools, and applications.

D2 Demonstrates an analytical and systematic approach to issue resolution.

D3 Takes the initiative in identifying and negotiating appropriate personal development opportunities.

D4 Demonstrates effective communication skills.

D5 Contributes fully to the work of teams.

D6 Plans, schedules, and monitors own work (and that of others where applicable) competently within limited deadlines and according to relevant legislation, standards, and procedures.

D7 Absorbs and applies technical information.

D8 Works to required standards.

D9 Appreciates the wider business context, and how own role relates to other roles and to the business of the employer or client

3 THE ACCREDITATION PROCESS, VISIT AND POSSIBLE OUTCOMES

These regulations and processes are overseen by the BCS Academic Accreditation Committee (AAC). This Committee is drawn from BCS membership who have experience of higher education and/or the computing industry. The Committee is served by a permanent secretariat, located within the Education Team at BCS. Its work is also supported through a Register of Assessors, who are Chartered members of BCS.

3.1 APPLYING FOR ACCREDITATION

BCS has a rolling programme of accreditation visits to consider programmes for accreditation. HEIs included in the programme are normally visited once every five years and are contacted by BCS when a visit is due. Visits usually consider the entire range of relevant programmes offered at the HEI. Typically, a visit is scheduled to take place in the final year of existing accreditation so that a continuous approved status may be achieved. Where, for whatever reason, a visit cannot take place within this timeframe, minimal backdating of accreditation will be considered provided the student work from the appropriate cohorts is presented. It is helpful if departments keep the BCS Academic Accreditation Team informed of changes they foresee regarding any scheduled visit.

For HEIs seeking accreditation for the first time, the following steps will be taken:

- **Initial review:** a documentary review, undertaken by a member(s) of the Academic Accreditation Committee, to determine programme suitability.
- **Advisory visit:** where recommended by the Initial Review, an advisory visit will be arranged, the report from which, will include information about any issues which would need to be addressed before a full visit could take place. An advisory visit may also be recommended where significant changes have been made or where accreditation has lapsed.
- **Accreditation visit:** where recommended as a result of the advisory visit, a full visit will be arranged.

It is recognised that changes to programmes will be introduced between visits. If major changes are made to programme learning outcomes, a number of different arrangements may be made, and advice should be sought in such situations.

3.2 DOCUMENTATION REQUIREMENTS

BCS requires documentation in support of the application for accreditation. HEIs are required to submit a full set of documentation, as set out in the appropriate application form.

The documentation is required in electronic format, either via a web portal set up by the HEI or a file sharing service **at least eight weeks before the date of the accreditation visit.**

In making a judgement, the Institution will consider evidence from a range of indicators at departmental and programme level, including:

- Quality assurance arrangements and processes at the programme level, including the arrangements for programme approval, annual monitoring, and periodic review.
- The human, physical and material resources used to support the programme.
- The HEI's internal regulations regarding academic progression and award of degrees.
- •Entry to the programme and how cohort entry extremes will be supported.
- Arrangements for student academic and pastoral support.
- The learning outcomes of the programme via programme and module specifications and the mapping of modules to BCS Accreditation Criteria / AHEP Learning Outcomes.
- The teaching and learning process and assessment strategies.
- Information about industry involvement in programme design and delivery.
- Arrangements for major projects, including representative samples of student work
- How any previous accreditation recommendations and requirements have been actioned.

3.3 ACCREDITATION VISIT OVERVIEW

A typical visit will take place over one day, where more than one Department or campus is included, visits will take place over one and a half, two, or more days.

The visiting Panel will normally have between three and five members depending on the number of programmes being submitted for accreditation, made up of academics and one industrialist. All members of the Panel will be Chartered members of BCS. The Panel will be supported by a member of the Academic Accreditation team.

During the visit, the Panel will expect to meet with students on the programmes being considered for accreditation and HEI staff, including the senior team and course team(s). The Panel will also expect to see laboratories and other teaching/collaboration spaces.

BCS will expect to visit all campuses involved in delivering programmes seeking accreditation. The HEI must inform BCS of any franchised or collaborative provision or programmes delivered at different campuses.

3.4 JOINT VISITS WITH OTHER ENGINEERING INSTITUTIONS

Some programmes may be appropriate for accreditation by both BCS and another institution or a group of institutions. BCS is happy to participate in or arrange accreditation visits with other PEIs. Where joint visits are arranged, the HEI will allocate the lead Institution.

Departments interested in a joint visit should contact both bodies. Due to the difficulty in reconciling visit schedules, it is advisable to discuss joint visit plans well in advance of the proposed date of the event. It should be noted that while PEIs will arrange for joint accreditation processing and visits, decisions are made independently by their respective accreditation committee.

3.5 ACCREDITATION VISIT OUTCOMES

The BCS Academic Accreditation Committee makes the final decision regarding the outcomes of the accreditation visit, based on the visit report drafted following the visit, summarising discussions that took place and the recommendations of the visiting Panel. The report serves the dual purpose of informing the AAC about the department and programme(s) and informing the HEI of the views of the visiting Panel.

The maximum period of accreditation is five years, but accreditation may additionally be backdated to allow cohorts of students whose work has been reviewed as part of the visit to benefit from the decision. A shorter period of accreditation may be granted if there are concerns about a programme's operation, or uncertainties about its future. Applications for accreditation will result in one of the following outcomes:

Action Plan: This is recommended when a Panel believes that areas of concern can be satisfactorily addressed prior to the report being considered by the Academic Accreditation Committee. The Panel will indicate the recommended outcome if the response is satisfactory.

90 Day Response: Prior to any decision being taken on the outcomes, the HEI is requested to respond to identified issues within 90 days of the receipt of the final report. BCS will indicate what is required by way of a response and the outcome will be one of the following outcomes.

Maximum period: The accreditation is for the maximum period of five years.

Reduced period: Normally, issues are identified with the programmes or the learning environment which BCS believes can/will be corrected. Thus, accreditation is for a period of less than five years. There are a range of reasons why a reduced term may be given, for example, to align with existing accreditation, or because of issues identified within the programme(s). The HEI may be asked to submit a report at the end of the specified period or receive a further accreditation visit before consideration can be given to extending the accreditation to the maximum five years.

Initial accreditation: new programmes which do not have final output available for review as part of the accreditation visit may be awarded initial accreditation, to be confirmed when the first cohort of students graduate. This will typically involve a desk-based review of documentation not available at the time of this visit, including, sample projects with mark sheets and external examiner reports together with responses.

Not accredited: In instances where a programme is not accredited, BCS will work with the HEI to achieve future accreditation by providing appropriate advice and support where possible.

Accreditation may be recommended with conditions, for example that a specific module should be undertaken and which must have a mechanism by which to evidence that the condition has been met, usually evidenced by the degree transcript.

3.6 ACCREDITATION VISIT OUTCOMES

Documentary submissions may be made between visits in the following circumstances:

Changes to accredited programmes: while it is expected that programmes will changes over time, if major changes are made to a programme or its delivery during the accreditation period, HEIs must notify BCS. This will also apply to programme title changes, which must be communicated to minimize the risk of inconvenience to membership applicants.

Confirmation of initial accreditation: the Academic Accreditation team will contact HEIs in advance of the deadline for receipt of documentation to confirm an initial recommendation. The deadline is normally one year after graduation of the first cohort and may need to be delayed if the programme has not produced at least three graduates. The initial recommendation will then be considered to confirm the accreditation for the maximum five-year period.

Own time submissions: a visiting Panel may invite the HEI to make a documentary submission in its own time for a programme(s) to be considered for accreditation. It is the responsibility of the HEI to submit the evidence requested, should it choose to do so, and no deadline is set; however, the HEI is asked to contact the Academic Accreditation Team in advance of making a documentary submission, for planning purposes.

Commonality review: if new programmes are introduced which share at least 70% commonality with an existing accredited programme, accreditation may be possible without a visit. Accreditation can only be recommended in line with the accredited programmes they have been assessed against. If the review reveals significant issues, the decision may be deferred until the next visit. If an accreditation visit is already scheduled, consideration may be deferred until the visit.

The HEI should provide the documentation requested by any of the above types of submission which will be reviewed wherever possible by members of the original visiting Panel.

BCS does not consider new programmes for accreditation between visits, unless:

1. The programme was identified as part of the previous accreditation visit but was not ready for consideration due to lack of documentation
2. The new programme title is a re-naming of an existing accredited programme for which the content remains unchanged
3. The department is introducing a new pathway for which the core modules are identical to an already accredited programme
4. The department is introducing a new programme which has significant overlap (at least 70%) with an already accredited programme.

3.7 PROGRAMME TITLE DIFFERENTIATION

Programmes that are delivered at multiple sites or by distance learning, either in the UK or abroad not seeking accreditation but which have the same title must be clearly distinguishable from those seeking accreditation, on the award transcript and/or certificate. Where there is no clear mechanism to identify place of study, programmes will not be accredited.

3.8 FEES AND CHARGES

Accreditation visits will only be made to HEIs which have a BCS HEI membership (Educational Affiliate), and which are up to date with their subscription payments. BCS annually reviews all costs incurred in academic accreditation activities to ensure that those costs are recovered in a fair and equitable way whilst continuing to maintain a high standard of support. BCS pays for a dedicated team of staff experts, supports a number of internal and external committees and their associated working parties, runs a team of accreditation assessors and provides training for assessors and HEIs. Visits to other UK campuses and delivery sites as part of the same accreditation activity will not incur any extra fee. Visits to non-UK campuses and delivery sites will incur the associated travel and accommodation costs of the Panel.

4 GENERAL ACCREDITATION GUIDANCE

4.1 DIRECT ENTRY

The department will need to demonstrate that rigorous and auditable processes are in place to ensure that appropriate prior learning has been completed and that the relevant BCS accreditation criteria and AHEP learning outcomes have been achieved for the stage of entry.

4.2 CONFIDENTIALITY

BCS treats all information it receives for the purpose of the accreditation process as confidential. The visit submission will only be shared with those involved in the visit. Visit reports and minutes of meetings will be shared with members of the Academic Accreditation Committee, the visiting Panel, the Academic Accreditation Team and from time to time, the Engineering Council (or representatives of the Washington Accord or EUR-ACE), representatives of the Seoul Accord and of EQANIE, or designated members of BCS in the case of an appeal. HEIs are encouraged to share their accreditation reports and outcomes with all stakeholders.

4.3 PRE-VISIT ADVICE MEETINGS AND HEI BRIEFING EVENTS

BCS arranges pre-visit meetings to assist with any policy or logistical questions before submission of the visit documentation. In addition, HEIs will have the opportunity to attend a briefing event.

APPENDIX 1

MULTIPLE SITE DELIVERY, FRANCHISED OR VALIDATED STUDY, STUDY ABROAD, WORK PLACEMENTS AND DISTANCE LEARNING

There is a set of varying arrangements where students achieving an award of an HEI do so in ways that reach beyond the traditional residential delivery and assessment of a curriculum. These include:

Multiple site delivery – where a programme of study of an HEI is delivered and assessed independently at different campuses of the HEI.

A statement on the HEI's organisation and the relationships between the various centres will be required.

The review of the programme and its set of intended learning outcomes will be undertaken once. Interest will focus upon the delivery and fulfilment of the programme at each centre. Matters of quality assurance and enhancement including resourcing, student support and achievement as positioned against the foregoing intended learning outcomes will be undertaken through a visit by a subset of the full Panel at each of the other centres. Documentation and related evidence in support of these interests will be required.

Any major variation of programme intended learning outcomes between centres will require a full separate visit to each centre.

Franchised study – where a programme of study of an HEI's designed and approved curriculum is delivered and potentially assessed by an organisation other than the awarding HEI. Such students may complete the study entirely at the franchisee organisation (total franchising) or transfer to the franchisor at some stage beyond the entry level of the curriculum (partial franchising).

Franchised programmes

In all cases the submission should include statements on:

- the motivation and the nature of the franchise
- the format and content of the certificates and transcripts

The review of partially franchised programmes will be similar to that for multiple site delivery as above.

Particular emphasis will be placed upon the synergy of the quality assurance and enhancement arrangements across the two organisations involved. Documentation and related evidence in support of these interests will be required.

It should be noted that for students to be eligible for accreditation they must spend at least the final taught year (full time equivalent) of study of the accredited award at the awarding HEI.

The review of totally franchised programmes will require a full visit to the franchisee organisation. It is assumed that the approved programme and its intended learning outcomes will have been reviewed at the franchising centre. Interest will focus upon the delivery of the programme at the franchisee organisation in terms of quality assurance and enhancement including resources, student support and achievement as positioned against the HEI's approved intended learning outcomes for the programme. Documentation and related evidence in support of these interests will be required.

Validated study – where the programme of study is designed and delivered by an organisation other than the awarding HEI but is validated and overseen by that HEI as one of its awards.

The review of validated programmes will require a full visit to the validated centre offering the curriculum and this will need to include representatives of the awarding HEI. A full set of documentation and supporting evidence will be required. Particular emphasis will be placed upon the synergy of the quality assurance and enhancement arrangements across the two organisations involved.

Study placements – where students undertake part of their studies at locations other than the awarding HEI. These might be in a different HEI or organisation within the UK or overseas.

Work placements – where students undertake some form of intercalated internship in support of their studies, which is assessed and features as a part of their achievement of the overall award: e.g., a sandwich degree.

For CITP/CEng accreditation, study and work placements that support the achievement of intended learning outcomes are of interest in the accreditation of programmes. BCS will not review these activities where they are supplementary to such achievement. Interest will focus upon the quality assurance and enhancement activities that underpin the validity of the study/work and assessment. Thus, the preparation of students for such activity along with the equity of learning opportunities, supervision and assessed achievement will be of concern. Documentation and related evidence in support of these interests will be required.

For RITTech accreditation, BCS will review the HEIs procedures and assessment processes for work-based learning activities.

Distance Learning – where students are supported in whole or in part in their learning and assessment remotely located from the delivering HEI. The method of delivery of the teaching and assessment may be by posted textual material or by electronic means. Programmes where delivery is delegated to another institution will normally be viewed as franchised programmes.

It is acknowledged that there is a spectrum of activities that underpin distance learning programmes; from those that are supplementary to on-campus students through to complete off-site/remote teaching, learning and assessment. The Institute has an expectation that such supplementary activities and the corresponding student support will be employed in the delivery of most programmes. However, if an HEI is engaged in delivering a curriculum that relies upon the latter methods of student engagement and assessment, then it would be useful for the HEI to discuss the detail of their delivery and assessment mechanisms with the Academic Accreditation Team so that an agreed process of accreditation can be put in place. A copy of the contract with the remote campus will be required as part of the accreditation process.

The home institution is responsible for ensuring that distance learning programmes are designed, delivered, and assessed so that the achievement of the intended learning outcomes can be assured. It is understood that distance learning programmes may be delivered to the student by a variety of media and that, in some cases, HEIs may use local partners to support the delivery of a distance learning programme.

In considering distance learning programmes BCS will pay particular attention to areas which are directly affected by the distance learning aspect, i.e. the methods of delivery, the provision of tutorial support, the extent and nature of practical activities (including group work), the supervision of projects, the methods of assessment, access to library and computing facilities, student involvement with programme monitoring and review, and the involvement of external examiners.

Full details of the programme content and structure will be required as specified in this document. The home institution should also supply information highlighting the differences in provision between programmes delivered directly at the host site and those delivered by distance learning, where appropriate, although it is recognised that some programmes may only be offered in distance mode.

In each of the above arrangements, the accreditation processes undertaken by BCS will be founded upon the basis that the study is suitable, well supported, and is undertaken within a sound framework of quality assurance and enhancement, ensuring that student achievement can be reliably assured. The detailed accreditation processes employed in any one instance will reflect this. Where any of these activities is outside the UK then permission will need to be sought from the local government and any in jurisdiction professional computing society for such an accreditation visit to proceed. Early advice should be sought from the Academic Accreditation Team (**educ@bcs.uk**) by HEIs seeking accreditation of programmes delivered by the arrangements above.

APPENDIX 2

BCS ACCREDITATION CRITERIA AND AHEP LEARNING OUTCOMES

Quality assurance and enhancement
1.1 Programmes are influenced by research, industry, and market requirements.
1.2 Programmes are appropriately titled and specified using intended learning outcomes which are accessible to all stakeholders.
1.3 Modules are mapped to the BCS criteria for the specific accreditation sought.
1.3 Programmes are delivered and students supported, employing appropriate resources in terms of staff, learning materials, equipment, and accommodation.
1.4 Support of student engagement and development takes cognisance of individual ability and evidenced prior achievement.
1.5 HEI regulations governing awards, as gauged through student achievement, properly underpin the fulfilment of the requirements of the accreditation sought.
1.6 Programme assessment, in terms of subject content and level, is appropriate and is overseen through relevant QAA (or equivalent if outside the UK) processes which engage with external examiners.
1.7 Quality assurance and enhancement processes are effective in supporting the delivery and evolution of programmes.
1.8 Any off-site learning and assessment activities of a programme are handled appropriately including: • study an work placements • franchised study • validated awards studied at another location
1.9 Employability skills are developed throughout the course of study and students are supported in their professional development.

Accreditation Criteria for CITP (Full or Partial): Undergraduate, Integrated, and Generalist Masters programmes

2.0 The programme contains sufficient computing content, as set out in table 1.5 of the Guidelines

Graduates have been assessed on the following abilities:

Computing-related cognitive abilities

Knowledge and understanding of:

2.1.1 Essential facts, concepts, principles, and theories relating to computing and computer applications as appropriate to the programme of study.

2.1.2 The use of such knowledge and understanding in the modelling and design of computer-based systems for the purposes of comprehension, communication, prediction, and the understanding of trade-offs.

2.1.3 The commercial and economic context of the development, use and maintenance of information systems.

2.1.4 Management techniques which may be used to achieve objectives within a computing context.

2.1.5 Information security issues in relation to the design, development, and the use of information systems.

2.1.6 The methods and issues involved in deploying systems to meet business goals.

2.1.7 Methods, techniques and tools for information modelling, management, and security.

2.1.8 Systems architecture and related technologies for developing information systems.

2.1.9 Mathematical and/or statistical principles appropriate to the nature of the programme.

The ability to:

2.1.10 Recognise and analyse criteria and specifications appropriate to specific problems, and plan strategies for their solution.

2.1.11 Analyse the extent to which a computer-based system meets the criteria defined for its current use and future development.

2.1.12 Deploy appropriate theory, practices and tools for the specification, design, implementation, and evaluation of computer-based systems.

2.1.13 Recognise the legal, social, ethical, and professional issues involved in the exploitation of computer technology and be guided by the adoption of appropriate professional, ethical and legal practices.

Computing-related practical abilities

The ability to:

2.2.1 Specify, design or construct computer-based systems.

2.2.2 Evaluate systems in terms of general quality attributes and possible trade-offs presented within the given problem.

2.2.3 Deploy effectively the tools used for the construction and documentation of computer applications, with particular emphasis on understanding the whole process involved in the effective deployment of computers to solve practical problems.

2.2.4 Use appropriate theoretical and practical processes to specify, design, deploy, verify, and maintain information systems, including working with technical uncertainty.

2.2.5 Define a problem, research its background, understand the social context, identify constraints, understand customer and user needs, identify, and manage cost drivers, ensure fitness for purpose, and manage the design process, and evaluate outcomes.

2.2.6 Apply the principles, methods, and tools of systems design to develop information systems that meet business needs.

Accreditation Criteria for CITP (Full or Partial): Undergraduate, Integrated, and Generalist Masters programmes

Transferable skills

2.3.1 An ability to work as a member of a development team recognising the different roles within a team and different ways of organising teams.

2.3.2 Development of transferable skills that will be of value in a wide range of situations, including; problem solving, working with others, effective information management and information retrieval skills, numeracy in both understanding and presenting cases involving a quantitative dimension, communication skills in electronic as well as written and oral form to a range of audiences and planning self-learning and improving performance as the foundation for on-going professional development.

Accreditation Criteria for Partial CITP: Specialist Masters programmes

3.0 The programme contains sufficient computing content, as set out in table 1.5 of the Guidelines

Graduates have been assessed on the following abilities:

Computing-related cognitive abilities

3.1.1 Demonstrate a systematic understanding of the knowledge of the domain of their programme of study, with depth being achieved in particular areas. This should include the foundations of the discipline and/or issues at the forefront of professional practice in the discipline; it should also include an understanding of the role of these in contributing to the effective design, implementation, and usability of relevant computer-based systems.

3.1.2 Demonstrate a comprehensive understanding of the essential principles or practices of the domain of the programme of study including current standards, processes, principles of quality and the most appropriate software support; the reasons for their relevance to the discipline and/or professional practice in the discipline; and an ability to apply these.

3.1.3 Understand and be able to participate within the legal, social, ethical, and professional framework within which they would have to operate as professionals in their area of study.

Computing-related practical abilities

3.2.1 Consistently produce work which applies and is informed by research at the forefront of the developments in the domain of the programme of study; this should demonstrate critical evaluation of aspects of the domain.

3.2.2 Demonstrate the ability to apply the principles and practices of the discipline in tackling a significant technical problem; the solution should demonstrate a sound justification for the approach adopted as well as self-critical evaluation of effectiveness but also a sense of vision about the direction of developments in aspects of the discipline.

Accreditation Criteria for Partial CITP: Specialist Masters programmes

Transferable skills

3.3.1	Carry out a critical review of the literature, current developments, and available software as well as the associated software processes.
3.3.2	Support the development of the self-directed learner who can set goals and select appropriate knowledge, skills, etc. as well as supporting tools for a particular purpose.
3.3.3	Recognise and be able to respond in an appropriate way to opportunities for innovation.
3.3.4	Participate effectively in the peer review process.
3.3.5	Undertake risk management associated with a range of activities.
3.3.6	Use appropriate processes to specify, design, deploy, verify, and maintain computer-based systems, including working with technical uncertainty.
3.3.7	Investigate and define a problem, identify constraints, understand customer and user needs, identify, and manage cost drivers, ensure fitness for purpose, and manage the design process and evaluate outcomes.
3.3.8	Apply the principles of appropriate supporting disciplines.
3.3.9	An ability to work as a member of a development team recognising the different roles within a team and different ways of organising teams.

Project Requirements

4.1	Students must be provided with written guidance on all aspects of the project, including selection, conduct, supervision, milestones, format of the report and the criteria for assessment.
4.2	The project report must meet the requirements set out in section 2.5 of the guidelines.
4.3.1	The individual project within an undergraduate honours or integrated masters degree should be a piece of work of at least 30 credit points at level 6.
4.3.2	The individual project within an ordinary or foundation degree for IEng should be a piece of work of at least 20 credit points level 5 or above.
4.3.3	The individual project within a specialist masters degree should be a piece of work of at least 60 credit points at level 7.
4.3.4	The individual project within a generalist masters programme should be a piece of work of at least 30 credit points at level 6 or above.
4.4	All projects should reflect the title and the aims and learning outcomes which characterise the programme as set out in the programme specification.
4.5	A project undertaken at masters level should reflect the ethos of advanced study and scholarship appropriate to a masters degree.
4.6	The project must be passed without compensation.
4.7	In the event of this major activity being undertaken as a group enterprise, there is a requirement that the assessment is such that the individual contribution of each student is measured against the learning outcomes.

Partial IEng	Partial IEng FL	Full IEng	Partial CEng	Partial CEng FL	Full CEng
Science and Maths					
F1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems	B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study	B1 Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study	C1 Apply knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Some of the knowledge will be at the forefront of the particular subject of study	M1 Apply a comprehensive knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Much of the knowledge will be at the forefront of the particular subject of study and informed by a critical awareness of new developments and the wider context of engineering	M1 Apply a comprehensive knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Much of the knowledge will be at the forefront of the particular subject of study and informed by a critical awareness of new developments and the wider context of engineering
Engineering Analysis					
F2 Analyse broadly-defined problems reaching substantiated conclusions	B2 Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles	B2 Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles	C2 Analyse complex problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles	M2 Formulate and analyse complex problems to reach substantiated conclusions. This will involve evaluating available data using first principles of mathematics, statistics, natural science and engineering principles, and using engineering judgment to work with information that may be uncertain or incomplete, discussing the limitations of the techniques employed	M2 Formulate and analyse complex problems to reach substantiated conclusions. This will involve evaluating available data using first principles of mathematics, statistics, natural science and engineering principles, and using engineering judgment to work with information that may be uncertain or incomplete, discussing the limitations of the techniques employed

F3 Use appropriate computational and analytical techniques to model broadly-defined problems	B3 Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed	B3 Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed	C3 Select and apply appropriate computational and analytical techniques to model complex problems, recognising the limitations of the techniques employed	M3 Select and apply appropriate computational and analytical techniques to model complex problems, discussing the limitations of the techniques employed	M3 Select and apply appropriate computational and analytical techniques to model complex problems, discussing the limitations of the techniques employed
F4 Select and use technical literature and other sources of information to address broadly-defined problems	B4 Select and evaluate technical literature and other sources of information to address broadly-defined problems	B4 Select and evaluate technical literature and other sources of information to address broadly-defined problems	C4 Select and evaluate technical literature and other sources of information to address complex problems	M4 Select and critically evaluate technical literature and other sources of information to solve complex problems	M4 Select and critically evaluate technical literature and other sources of information to solve complex problems
Design and Innovation					
F5 Design solutions for broadly-defined problems that meet a combination of user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal and environmental matters, codes of practice and industry standards	B5 Design solutions for broadly-defined problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards	B5 Design solutions for broadly-defined problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards	C5 Design solutions for complex problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards	M5 Design solutions for complex problems that evidence some originality and meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards	M5 Design solutions for complex problems that evidence some originality and meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards
F6 Apply a systematic approach to the solution of broadly-defined problems	B6 Apply an integrated or systems approach to the solution of broadly-defined problems	B6 Apply an integrated or systems approach to the solution of broadly-defined problems	C6 Apply an integrated or systems approach to the solution of complex problems	M6 Learning outcome achieved at previous level of study	M6 Apply an integrated or systems approach to the solution of complex problems

The Engineer in Society					
F7 Evaluate the environmental and societal impact of solutions to broadly-defined problems	B7 Learning outcome achieved at previous level of study	B7 Evaluate the environmental and societal impact of solutions to broadly-defined problems	C7 Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts	M7 Evaluate the environmental and societal impact of solutions to complex problems (to include the entire life-cycle of a product or process) and minimise adverse impacts	M7 Evaluate the environmental and societal impact of solutions to complex problems (to include the entire life-cycle of a product or process) and minimise adverse impacts
F8 Identify ethical concerns and make reasoned ethical choices informed by professional codes of conduct	B8 Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct	B8 Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct	C8 Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct	M8 Learning outcome achieved at previous level of study	M8 Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct
F9 Identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity	B9 Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity	B9 Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity	C9 Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity	M9 Learning outcome achieved at previous level of study	M9 Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity
F10 Adopt a holistic and proportionate approach to the mitigation of security risks	B10 Learning outcome achieved at previous level of study	B10 Adopt a holistic and proportionate approach to the mitigation of security risks	C10 Adopt a holistic and proportionate approach to the mitigation of security risks	M10 Learning outcome achieved at previous level of study	M10 Adopt a holistic and proportionate approach to the mitigation of security risks
F11 Recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion	B11 Learning outcome achieved at previous level of study	B11 Recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion	C11 Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion	M11 Learning outcome achieved at previous level of study	M11 Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion

Engineering Practice					
F12 Use practical laboratory and workshop skills to investigate broadly-defined problems	B12 Learning outcome achieved at previous level of study	B12 Use practical laboratory and workshop skills to investigate broadly-defined problems	C12 Use practical laboratory and workshop skills to investigate complex problems	M12 Learning outcome achieved at previous level of study	M12 Use practical laboratory and workshop skills to investigate complex problems
F13 Select and apply appropriate materials, equipment, engineering technologies and processes	B13 Learning outcome achieved at previous level of study	B13 Select and apply appropriate materials, equipment, engineering technologies and processes	C13 Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations	M13 Learning outcome achieved at previous level of study	M13 Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations
F14 Recognise the need for quality management systems and continuous improvement in the context of broadly-defined problems	B14 Learning outcome achieved at previous level of study	B14 Recognise the need for quality management systems and continuous improvement in the context of broadly-defined problems	C14 Discuss the role of quality management systems and continuous improvement in the context of complex problems	M14 Learning outcome achieved at previous level of study	M14 Discuss the role of quality management systems and continuous improvement in the context of complex problems
F15 Apply knowledge of engineering management principles, commercial context and project management	B15 Apply knowledge of engineering management principles, commercial context, project management and relevant legal matters	B15 Apply knowledge of engineering management principles, commercial context, project management and relevant legal matters	C15 Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights	M15 Learning outcome achieved at previous level of study	M15 Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights
F16 Function effectively as an individual, and as a member or leader of a team	B16 Learning outcome achieved at previous level of study	B16 Function effectively as an individual, and as a member or leader of a team	C16 Function effectively as an individual, and as a member or leader of a team	M16 Function effectively as an individual, and as a member or leader of a team. Evaluate effectiveness of own and team performance	M16 Function effectively as an individual, and as a member or leader of a team. Evaluate effectiveness of own and team performance
F17 Communicate effectively with technical and non-technical audiences	B17 Learning outcome achieved at previous level of study	B17 Communicate effectively with technical and non-technical audiences	C17 Communicate effectively on complex engineering matters with technical and non-technical audiences	M17 Communicate effectively on complex engineering matters with technical and non-technical audiences, evaluating the effectiveness of the methods used	M17 Communicate effectively on complex engineering matters with technical and non-technical audiences, evaluating the effectiveness of the methods used
F18 Plan and record self-learning and development as the foundation for lifelong learning/CPD	B18 Learning outcome achieved at previous level of study	B18 Plan and record self-learning and development as the foundation for lifelong learning/CPD	C18 Plan and record self-learning and development as the foundation for lifelong learning/CPD	M18 Learning outcome achieved at previous level of study	M18 Plan and record self-learning and development as the foundation for lifelong learning/CPD

APPENDIX 3

ENGINEERING COUNCIL - COMPENSATION AND CONDONEMENT

INTRODUCTION

The Engineering Council has adopted a definition of compensation and condonement, which is set out in the **Compensation and Condonement Policy**, for use in consideration of the accreditation of undergraduate and postgraduate degree programmes.

The Engineering Council defines compensation as: "The practice of allowing marginal failure (i.e., not more than 10% below the nominal pass mark) of one or more modules and awarding credit for them, often on the basis of good overall academic performance."

The Engineering Council defines condonement as: "The practice of allowing students to fail and not receive credit for one or more modules within a degree programme, yet still qualify for the award of the degree."

In the consideration of the accreditation of undergraduate and postgraduate degree programmes:

1. Evidence that all AHEP learning outcomes are met by all variants of each programme must be provided before accreditation can be granted.
2. No condonement of modules delivering AHEP learning outcomes is allowed.
3. A maximum of 30 credits in a Bachelors or integrated Masters degree programme can be compensated, and a maximum of 20 credits in a Masters degree other than the integrated Masters degree.
4. Major individual and group-based project modules must not be compensated.
5. The minimum module mark for which compensation is allowed is no more than 10% below the nominal module pass mark (or equivalent if a grade-based marking scheme is used). The key consideration in the rules above is to ensure that graduates of accredited engineering degree programmes have met all the programme learning outcomes specified in the Engineering Council's AHEP (Accreditation of Higher Education Programmes) specification.

GUIDANCE ON THE NEW REGULATIONS

The Engineering Council has published **Guidance Notes**, which should be read in conjunction with the policy.

APPENDIX 4: APPEALS PROCEDURE

REQUEST FOR A REVIEW OF A BCS ACADEMIC ACCREDITATION COMMITTEE DECISION

1. INTRODUCTION

This policy applies to appeals against decisions made by BCS, The Chartered Institute for IT for accreditation of programmes of study in connection with the award of Chartered status or RITTech.

2. WHO CAN APPEAL?

Any Higher Education Institution (HEI) that has Educational Affiliate status with BCS that wishes to appeal the outcome of an accreditation visit in connection with the award of Chartered status or RITTech.

3. GROUNDS FOR AN APPEAL

Grounds for appeal will usually be limited to:

- Evidence that the proper processes in undertaking the accreditation assessment (as stated in the BCS Guidelines on course accreditation) have not been followed.
- Evidence that in reaching the decision the proper processes or conduct of the Academic Accreditation Committee or Academy of Computing Board meetings have not been followed.

4. STAGES OF APPEAL

There are three stages for making an appeal:

Stage 1: HEI to present a 'prima facie' case for the appeal

Documentation required: The case should be presented in no more than 2 sides of A4, illustrating how the appeal is valid in the context of the grounds outlined in paragraph 3.

To be considered by: BCS Officers outside of the Education Team

Timescale: case to be submitted within 30 days of receipt of the final approved report and accreditation decisions.

Possible outcomes: Education Team to write to HEI to inform whether their case has been accepted (go to Stage 2) or rejected (providing a rationale to the HEI for rejection). Response to be provided within 10 working days and the decision is final.

Stage 2: Full appeal if case is accepted

Documentation required: Letter of appeal and supporting documents which provide details of the evidence for the appeal

To be considered by: Appeal Panel which comprises

- Two members of AAC one of whom is normally the Chair or Vice Chair of AAC
- Member of the Assessor Register not on AAC
- An external representative from the academic community knowledgeable about the accreditation process, e.g., a member of EPC (Engineering Professors' Council) or CPHC (Council of Professors and Heads of Computing)

One Member will be nominated to act as Chair. Members of the Appeal Panel must not have been involved in the original accreditation decision nor have any involvement with the appellant HEI.

Two representatives from the appellant HEI and the Panel Chair from the visit will be invited to attend the meeting either in person or via video conference.

The BCS Academic Accreditation team will act as Secretary to the Appeal Panel but is not eligible to vote and does not count towards the quorum.

The quorum shall be three Appeal Panel members and should normally include the external representative from the academic community. Appeal Panel members may join the Panel and vote either in person or via video conference.

Timescale: within 90 days of written appeal submission

Possible outcomes: The Appeal Panel may

- Uphold the appeal
- Dismiss the appeal (providing a rationale to the HEI for dismissal)

Where the appeal is upheld, the outcome will detail the point at which the assessment process should be reinstated. A further visit with different Panel Members or submission of additional information may be required.

The Secretariat will produce a draft report which will be submitted to the Appeal Panel for comment and correction.

Where the appeal is dismissed: If the proper processes have not been followed by the BCS Appeal Panel the appellant may request consideration of its appeal by the BCS Academy of Computing Board, but they must show evidence to support the claim that the processes have not been followed (go to Stage 3).

Stage 3: HEI may appeal against a dismissed decision

Documentation required: Letter of appeal and supporting documents

To be considered by: Academy of Computing Appeal Panel which will look for assurances that the proper processes were carried out in considering the appeal and there is no evidence of grounds on which to uphold the appeal. An Academy for Computing Board Appeal Panel will be constituted as follows:

- A past Chair (or experienced past member) of the Academic Accreditation Committee who is no longer active on the Committee, not involved in the original panel or with the HEI, to act as Chair, or their similarly independent nominee
- Two nominees from the membership of the BCS Academy of Computing Board

Members of the Academy of Computing Appeal Panel must not have been involved in the original accreditation decision nor have any involvement with the appellant HEI.

The quorum shall be two including the Chair. The Chair of the Appeal Panel will have the casting vote.

[**NB:** The Academy of Computing Appeal Panel should not have to review the accreditation assessment. The role of the Academy for Computing Board Appeal Panel is to provide an independent review of the process of the assessment of the appeal. Consideration of an appeal may only extend to the grounds for appeal permitted by this policy.]

Timescale: within **10 working days** of outcome of appeal

Possible outcomes: The Academy of Computing Appeal Panel may:

- Confirm the decision of the Appeal Panel (providing a rationale to the HEI)
- Overturn the decision of the Appeal Panel, referring it back to the Appeal Panel at Stage 2

At its discretion, the Academy of Computing Appeal Panel may request more evidence to support the grounds for appeal cited by the HEI to assist in reaching a decision.

A decision made by BCS Academy of Computing Board Appeal Panel will be final.

5. FEES

A fee of £500 will be payable when the appeal is lodged. If the appeal is upheld by the Appeal Panel or the Academy Board for Computing Appeal Panel the appeal fee paid will be refunded.

For further information please contact:

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