Guidelines on course accreditation

Information for universities and colleges

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bcs
The Chartered Institute for IT

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 duty includes the responsibility to develop and maintain standards for the educational foundation appropriate to people wishing to follow a career in information systems.

BCS initially established the BCS Professional Examinations to provide an educational foundation for people wishing to become members of the professional body. As the number and range of programmes at degree level increased, a system of exemptions for appropriate programmes was put in place to provide alternative routes to membership. BCS became a licensed body of the Engineering Council in 1990 and can accredit for Chartered Engineer or Incorporated Engineer status. The BCS Chartered IT Professional standard was introduced in 2004 and the BCS Registered IT Technician (RITTech) standard was added in November 2015. RITTech provides a benchmark enabling technicians to evidence current competence and to gain recognition of their professionalism across digital and tech industries.

BCS undertakes a programme of visits to Higher Education Institutions (HEIs) and other higher education providers to consider their programmes for accreditation leading to CITP and CEng or IEng and/or RITTech status. BCS actively encourages both UK and non-UK (subject to local in jurisdiction bodies) HEIs 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 in particular to liaise with the BCS Secretariat 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.

Where there are small numbers of students on a programme, BCS will not normally consider it for accreditation but suggests that students apply for membership/registration individually (see Section 5). If a named award with few students enrolled forms a pathway through a more general programme of study, then BCS may well deal with such programmes as part of the overall accreditation of that group of awards.

The following three documents inform these Guidelines:

- The BCS standard for CITP
- The Engineering Council publishes the learning outcomes and criteria for registration in its document UK Standards for Professional Engineering Competence (UK-SPEC) at www.engc.org.uk/
- The BCS standard for RITTech

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 of 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 and its Code of Good Practice that are periodically reviewed in the light of experience. The current versions of these are available at www.bcs.org/codes

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 undergraduate subject benchmark 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 to honours degree level, the techniques and skills which are associated with developing an understanding of computing, and the level and intellectual demand and challenge which are appropriate to honours degree study of computing. As such it forms an excellent framework which BCS and higher education can use to support the accreditation process. Benchmarking information can be found at www.qaa.ac.uk.

Programmes being put forward for accreditation should ensure that there is significant study and learning outcomes as defined by the cognate area of computing as set out in Sections 2 and 3 of the QAA Computing Benchmark. Evidence will be required showing that the principles of programme design set out in Section 4 of the QAA Computing Benchmark 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 year long 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.

1.5 Accreditation

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

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

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 where the period of industrial placement is assessed as part of the overall programme of study.

BCS, through its Academic Accreditation Committee (AAC), considers each programme in relation to one or more of:

- the criteria described by BCS for registration as a Chartered IT Professional
- the criteria described in UK-SPEC, which defines the routes to Chartered and Incorporated Engineer registration of the Engineering Council
- the criteria described by BCS for registration as a Registered IT Technician

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

The exemplifying academic qualification for IEng is an accredited bachelors or honours degree in the computing field, or foundation degree in computing, plus appropriate further learning to degree level.

The exemplifying academic qualification for CEng is an accredited honours degree followed by an accredited specialist masters programme or appropriate further learning to masters level; or through an integrated masters programme.

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.

[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/)

Thus, an accredited programme is one which meets some or all of the educational requirements for registration with BCS as a:

Chartered IT Professional

Chartered or Incorporated Engineer

Table 1.5

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 1computing	Accredited as partially meeting the requirements 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 requirements 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 meeting the requirements 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 meeting the requirements 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 requirements for CITP and partially meeting the requirements 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 requirements 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 meeting the requirements 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 meeting the requirements for CITP and fully meeting the requirements for 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.

Some programmes may meet the requirements for more than one of the above. Individual registration details are explored further in section 5.2 of these Guidelines.

Any programme which is put forward for accreditation must meet the relevant programme criteria as detailed in sections 2.2 to 2.5, as well as being developed and delivered in an environment which meets the criteria as detailed in section 2.1. In addition to meeting the criteria outlined in section 2, no more than one-third of the material in an accredited undergraduate programme may normally lie outside the scope of the undergraduate 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 to the BCS criteria.

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 Criteria for accreditation

In carrying out 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 III of the Guidelines 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 relevant benchmark statement, namely the QAA Computing Benchmark for honours degrees and the QAA Subject Benchmark Statement, Master's Degrees in 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.

In this section, items in *italics* are taken from the QAA Computing Benchmark.

When considering accreditation, BCS seeks evidence that:

- the programme is up to date and conveys a sense of excitement about 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 must contain sufficient computing content as set out in table 1.5 of these Guidelines.

Cognitive, practical and transferable *skills need to be placed in the context of the programme of study. There is an implicit interplay between these identified skills both within and across these three categories.*

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).

Within this document, the following terms are used with the meaning stated:

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

Knowledge is information that can be recalled.

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

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

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 externally conducted institutional reviews and internal reviews of the department.

BCS requires evidence that the students on the programme are adequately 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 their programme(s). The maximum period for completion is normally 6 years (and 8 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 recognizes that different terminology, particularly for non-UK institutions, may exist). As mentioned above, where compensation is permitted under HEI regulations, BCS must be assured that the overall learning outcomes of the programme are not undermined. As a general rule, in the final year of the programme normally only 20 out of 120 credits may be compensated; however, this is a guideline and will be considered in the context of the delivery of the programme learning outcomes.

The Engineering Council rules 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 V.

HEIs are required to notify BCS if, during the course of an accreditation period, there are significant changes to the learning environment in which a course is delivered. Changes to the Quality Assurance system, the compensation requirements and/or the Learning Support must be communicated to the BCS Education Team educ@bcs.uk.

2.2 Undergraduate programmes

Undergraduate programmes at honours level can be considered for accreditation for CITP and CEng, industrial placements as part of these programmes and Degree Apprenticeship programmes can also be considered for accreditation for RITTech. Honours degree level programmes will be accredited as partially meeting the educational requirement for CEng. Section 2.2.1 sets out the core requirements expected for accreditation. Section 2.2.2 provides specific requirements for CITP and Section 2.2.3 provides specific criteria for partially meeting the educational requirements for CEng.

Degree Apprenticeship programmes or the industrial placement component of undergraduate programmes that might not be eligible for accreditation for CITP may be considered for accreditation for RITTech. Section 2.7 provides specific requirements for RITTech.

2.2.1 Core requirements for accreditation of honours programmes

The general requirements for accreditation are based on the QAA Subject Benchmark for Computing. Those taken directly from the QAA Benchmark for Computing are provided in italics.

Graduates should have been assessed on the following abilities.

Computing-related cognitive abilities

- *Knowledge and understanding of essential facts, concepts, principles and theories relating to computing and computer applications as appropriate to the programme of study*
- 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*
- The ability to *recognise and analyse criteria and specifications appropriate to specific problems, and plan strategies for their solution*
- The ability to *analyse the extent to which a computer-based system meets the criteria defined for its current use and future development*
- The ability to *deploy appropriate theory, practices and tools for the specification, design, implementation and evaluation of computer-based systems*
- The ability to *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*
- Knowledge and understanding of the commercial and economic context of the development, use and maintenance of information systems
- Knowledge and understanding of the *management* techniques which may be used to achieve objectives within a computing context

- Knowledge and understanding of *information security* issues in relation to the design, development and use of information systems

Computing-related practical abilities

- *The ability to specify, design* or *construct computer-based systems*
- *The ability to evaluate systems in terms of* general *quality attributes and possible trade-offs presented within the given problem*
- *The ability to recognise any risks* or *safety aspects that may be involved in the* operation *of* computing and information *systems within a given context*
- *The ability to 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*

Transferable skills

- An ability to work as a member of a development *team* recognising the different roles within a team and different ways of organising teams
- The development of transferable skills that will be of value in a wide range of situations. These include *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

N.B. This core set of transferable skills meets the requirements for CITP and CEng. Therefore, no additional transferable skills are presented in 2.2.2 and 2.2.3.

2.2.2 Additional requirements for CITP

In addition to the core requirements outlined in section 2.2.1 graduates from all accredited CITP programmes should have been assessed on the following abilities:

Computing-related cognitive abilities

- knowledge and understanding of the methods and issues involved in deploying systems to meet business goals
- knowledge and understanding of methods, techniques and tools for information modelling, management and security
- knowledge and understanding of systems architecture and related technologies for developing information systems
- knowledge and understanding of mathematical and/or statistical principles appropriate to the nature of the programme

Computing-related practical abilities

- use appropriate theoretical and practical processes to specify, design, deploy, verify and maintain information systems, including working with technical uncertainty
- 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
- apply the principles, methods and tools of systems design to develop information systems that meet business needs

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2.2.3 Additional requirements for CEng

Should an Honours degree programme be accredited in partial fulfilment of CEng, graduates will automatically be eligible for full IEng accreditation.

In addition to the core requirements outlined in section 2.2.1 graduates from all accredited CEng programmes should have been assessed on the following abilities:

Computing-related cognitive abilities

- knowledge and understanding of the use of engineering principles in the creation, use, support and decommissioning of information systems for the solution of practical problems, founded on appropriate scientific and technological disciplines

- knowledge and understanding of mathematical and statistical principles necessary to underpin their programme of study and the ability to apply mathematical and statistical methods, tools and notations proficiently in the analysis and solution to problems
- knowledge and understanding of the principles of computational modelling used for the comprehension of engineering phenomena

Computing-related practical abilities

- use appropriate theoretical and practical processes to specify, design, implement, verify and maintain computer-based systems, including working with technical uncertainty
- 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
- apply the principles of appropriate supporting engineering and scientific disciplines

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2.2.4 Requirements for IEng

Ordinary BEng or BSc programmes in the computing field will normally be accredited as meeting the educational requirement for IEng. Such awards should have programme intended learning outcomes separate to any honours version of the programme. Similarly, ordinary degrees being considered for accreditation must also have their own programme intended learning outcomes, and not simply be 'exit awards' from an honours programme.

Foundation degrees in the computing field will normally be accredited as partially meeting the educational requirement for IEng.

Graduates should have been assessed on the following abilities:

Computing-related cognitive abilities

- knowledge and understanding of essential facts, concepts, principles and theories relating to computing and computer applications as appropriate to the programme of study
- a knowledge of the engineering and underpinning scientific principles underpinning relevant current technologies and their evolution
- a knowledge of the mathematics and statistics necessary to support the application of key engineering principles
- understanding of the principles of managing computing processes
- a knowledge of the commercial and economic context of the development, use and maintenance of computer-based systems
- a knowledge of the management techniques which may be used to achieve objectives within a computing context

Computing-related practical abilities

- the ability to deploy appropriate theory, practices and tools for the specification, design and implementation of computer-based systems according to customer and user needs and use innovation and creativity in a practical and social context
- the ability to evaluate systems in terms of general quality attributes and possible trade-offs presented within the given problem
- the ability to recognise and analyse criteria and specifications appropriate to specific problems, and plan strategies for their solution
- the ability to model and analyse the extent to which a computer-based system meets the criteria defined for its current use and future development
- the ability to 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
- the ability to recognise any risks or safety aspects that may be involved in the operation of computing and information systems within a given context
- the ability to deploy effectively the tools used for the construction and documentation of computer applications and to use and apply information from technical literature

2.3 Integrated masters programme criteria

Integrated masters programmes may be considered for CITP accreditation and full CEng accreditation. In addition, joint honours integrated masters programmes which meet the credit requirements in Table 1.5 may be considered for full CITP accreditation.

Programmes seeking CEng accreditation must include a substantial emphasis on developing knowledge and understanding of the processes for development of innovative systems at masters level.

Programmes seeking CITP must include an emphasis on the deployment of IT solutions to address business issues.

For CITP, the requirements are identical to those for undergraduate programmes and are given in sections 2.2.1 and 2.2.2.

For CEng, the requirements given in sections 2.4.1, 2.4.3 and 2.4.4 for specialist masters programmes must be met and also allow students to demonstrate the following in the final and penultimate years:

- **their ability to apply the 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**
- **awareness of wider customer contexts and the identification of problems that such contexts might deliver**
- **the ability to work co-operatively (for example, as a team) to deliver a significant piece of work**
- **critical self-evaluation of the process**

These criteria are normally met by a piece of team-based, major (30 credit) project work at level 6 or above; if this is the case it should be passed without compensation. Where an integrated masters programme does not have a major team-based project at level 6 or above, HEIs will need to evidence that these criteria have been met through group/collaborative work in other areas of the programme, as a coherent entity of study, that equates to 30 credit points of effort. For example, a coherent 30 credit or more project could be distributed between modules/units and even levels of study (L6 or above).

2.4 Postgraduate programmes

BCS recognises that there is a variety of postgraduate programmes in computing, ranging from specialist MSc programmes that build on the knowledge and understanding developed in undergraduate programmes in computing to generalist MSc programmes that offer an opportunity for graduates from other disciplines. The rich range of MSc programmes is described in the QAA Subject Benchmark Statement, Master's Degrees in Computing, 2011 that can be viewed at www.qaa.ac.uk.

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 may be considered for accreditation for partial CITP and accreditation as partially meeting the educational requirement for CEng. Where the programme includes assessment of work-based learning and training or an assessed industrial placement they are also eligible to be considered for RITTech accreditation. Typically, the nature of a specialist masters programme put forward for accreditation will bias it toward an engineering ethos, which will then determine its acceptability for CEng accreditation. Where the programme places substantial emphasis on processes for the development of innovative systems consideration for accreditation as partially meeting the educational requirement for CEng is appropriate.

Programmes seeking partial CITP must include an emphasis on the foundations of computing and/or current professional issues and techniques.

Generalist masters programmes are typically designed to allow graduates from non-computing related subject areas to transfer to computing. The majority of the content of these programmes should be at masters level but may contain a proportion of material that provides sufficient bridging for students from non-computing backgrounds to undertake study at level 7. Beyond these requirements, programmes may be designed to address the needs of local employers and/or attract the imagination of possible students – which should be reflected in the masters level learning outcomes for the programme as well as providing coverage of legal, social, ethical and professional issues.

Generalist masters programmes will be considered for partial CITP accreditation and industrial placements assessed as part of these programmes can also be considered for RITTech accreditation.

2.4.1 Core requirements for accreditation of specialist masters programmes

Transferable skills

- Carry out a critical review of the literature, current developments and available software as well as the associated software processes
- 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
- Recognise and be able to respond in an appropriate way to opportunities for innovation
- Participate effectively in the peer review process
- Undertake risk management associated with a range of activities
- Use appropriate processes to specify, design, deploy, verify and maintain computer-based systems, including working with technical uncertainty
- 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
- Apply the principles of appropriate supporting disciplines
- An ability to work as a member of a development team recognising the different roles within a team and different ways of organising teams

N.B. This core set of transferable skills meets the requirements for Partial CITP and CEng. Therefore, no additional transferable skills are presented in 2.4.2 and 2.4.3.

2.4.2 Specialist masters additional requirements for CITP

In addition to the core requirements outlined in section 2.4.1 graduates should have been assessed on the following abilities:

Computing-related cognitive abilities

- 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
- demonstrate a comprehensive understanding of the essential principles and 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
- 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

- 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
- 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 a self-critical evaluation of effectiveness but also a sense of vision about the direction of developments in aspects of the discipline

2.4.3 Specialist masters additional requirements for CEng

In addition to the core requirements outlined in section 2.4.1 graduates should have been assessed on the following abilities:

Computing-related cognitive abilities

- a systematic understanding of knowledge, and a critical awareness of current problems and/or new insights in the development and implementation of systems, much of which is at, or informed by, the forefront of their field of study
- a comprehensive understanding of the state-of-the-art techniques and methodologies for developing systems
- understand and be able to participate within the legal, social, ethical and professional framework as professionals in systems, software or information engineering

Computing-related practical abilities

- develop and apply new technologies
- show originality and innovation in the application of knowledge and techniques for developing systems
- make general evaluations of commercial risk through some understanding of the basis of such risks

2.4.4 Requirements for generalist masters programmes

Generalist masters programmes will be considered only for partial CITP accreditation, to ensure parity with joint honours programmes. They will need to include coverage of legal, social, ethical and professional issues as well as including 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 almost 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 under section 2.2.1 and 2.2.2.

2.5 Projects

An individual project is an expectation within undergraduate, integrated masters, and postgraduate masters programmes. 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.

All projects should reflect the aims and learning outcomes which characterise the programme to which they contribute as set out in the programme specification.

Project reports

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

2.5.1 Undergraduate individual project requirements

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. The project must be passed without compensation.

2.5.2 Postgraduate project requirements

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. The project must be passed without compensation.

2.5.3 Notes for guidance on projects

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.

2.6 Further guidance on specific criteria

In applying for accreditation, HEIs are required to map the core modules for each programme to the BCS criteria for the specific accreditation sought. HEIs are required to provide a commentary on where each criterion is taught and assessed. This commentary can be provided in the notes section of the mapping table or within an individual cell. The following sections provide guidance on some of the key criteria.

2.6.1 Legal, social, ethical, and professional issues *(criteria 2.1.6, 6.2.5, 8.1.3, and 9.1.3)*

Programmes seeking accreditation must cover and assess the ***legal, social, ethical, and professional issues (LSEPIs)*** relating to computing.

Where institutions are seeking full CEng accreditation for integrated masters programmes, evidence of LSEPI coverage at Level 7 will be required.

These matters should include the function of professional bodies, including the role of the BCS Codes of Conduct and Good Practice.

Students should understand the implications of the relevant statute laws which impact on the work of the information systems engineering professional. It should be noted that as new laws are introduced at national and international level and acts are updated, such changes should be reflected in the curriculum.

The programme should give students an awareness of external factors which may affect the work of the computer professional. These may vary according to the orientation of the programme and the likely destination of students, but examples could include:

- acceptance of responsibility for work which affects the public well-being
- computer security
- principles of management including change and project management
- industrial relations
- environmental and sustainability aspects
- economic and commercial factors
- globalisation
- accessibility
- Intellectual Property and related issues
- design, implementation and maintenance of trustworthy software

Students should not perceive LSEPIs as peripheral to, or less significant than, technical skills detailed in the syllabus. Topics which are not assessed may be seen by students as unnecessary. BCS considers that adequate coverage of LSEPIs is important in the assessment and examination of accredited programmes and accepts that the requirements may be met in many ways.

Awareness of professional standards, codes of conduct and relevant legislation must not be separated from the practice of designing and implementing systems. Whilst it is appropriate for some of these issues to be addressed in separate modules, it is essential that these topics are integrated into the programme and should be referred to in the project.

The relevant LSEPIs should be specifically detailed in the syllabus, mentioned in directions to students on practical assignments and sandwich placements, and not left solely to the discretion of individual lecturers. Whilst LSEPIs should pervade the programme, the central issues of codes of conduct and practice, legislation and ethical standards are important to all information systems engineering practitioners. Therefore, they should be addressed within core areas of the programme rather than in options alone.

In gaining accreditation it is expected that all staff should demonstrate and maintain high professional standards in their own use and practice of information systems. Membership of a professional body would be one sign of such a commitment. The production and promulgation of codes of conduct for students and the displaying of notices relating to such things as copying software and virus protection are also signs of such a commitment. Encouragement of student membership is also regarded by BCS as a sign of a commitment to professional standards by the teaching unit.

The BCS Code of Conduct is available on the website at www.bcs.org/codes.

2.6.2 Trustworthy software

Trustworthy Software is defined as the enhancement of the overall software and systems culture, with the objective that software should be designed, implemented, and maintained in a trustworthy manner. This specifically refers to the British Standards Institution PAS 754 Software trustworthiness.

2.6.3 Risk and safety *(criteria 2.2.3, 6.2.6)*

Risk is inherent in most information systems. Where appropriate, graduates should be exposed to the concepts of risk as they relate to (for example):

- unauthorised (malicious or accidental) disclosure, modification, or destruction of information
- unintentional errors and omissions
- IT disruptions due to natural or man-made disasters

- failure to exercise due care and diligence in the implementation and operation of the IT system and how such risks can be managed

The safe operation of IT systems beyond individual health and safety should also be addressed, for example the role of fault tolerance, high availability systems and testing regimes that include out-of-specification cases. For CEng accreditation, it is important that aspects specific to commercial risk (9.2.3) are explicitly addressed, for example, a programme may get students to consider the financial costs of a systems failure within a business context.

2.6.4 Cybersecurity *(criteria 2.1.6 and 2.1.9)*

For a given computer technology development or information system – such as an individual service, application, server, network device, laptop, smartphone or network or combinations thereof – students will be expected to show knowledge and understanding of the core concepts and principles within the following themes where this is relevant to the Programme Learning Outcomes under consideration:

1. **Information and risk**: models including confidentiality, integrity and availability (CIA); concepts such as probability, consequence, harm, risk identification, assessment and mitigation; and the relationship between information and system risk

2. **Threats and attacks:** threats, how they materialise, typical attacks and how those attacks exploit vulnerabilities

3. **Cybersecurity architecture and operations:** physical and process controls that can be implemented across an organisation to reduce information and systems risk, identify, and mitigate vulnerability, and ensure organisational compliance

4. **Secure systems and products**: the concepts of design, defensive programming and testing and their application to build robust, resilient systems that are fit for purpose

5. **Cybersecurity management:** understanding the personal, organisational, and legal/regulatory context in which information systems could be used, the risks of such use and the constraints (such as time, finance, and people) that may affect how cybersecurity is implemented.

It is commonly recognised that information security concerns are most appropriately addressed as integral rather than as an add-on to the design of information systems. Consequently, the teaching of security issues is ideally embedded across computing and IT-related subject areas.

Approaches using specific application, for example the specifying of requirements for CIA of personally identifiable information being stored and/or processed by a system or the use and analysis of threat data in the selection of security arrangements, are recommended.

Further resources on Cybersecurity principles and learning outcomes for computer science and IT-related degrees are available at https://cphcuk.files.wordpress.com/2015/06/j0028-isc2-white-paper-a4-v5-260515lr.pdf

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2.6.5 Groupwork *(criteria 2.3.1, 5.1 and 7.1.9)*

BCS expects that students will gain experience of the challenges of working in a group environment in both undergraduate and post graduate programmes (criteria 2.3.1 (undergraduate), 5.1 (integrated masters), and 7.1.9 (postgraduate)) and this is an explicit requirement for CEng accreditation. Students should be taught and assessed on their **ability to work as a member of a development team** recognising the different roles within a team and ways of organising teams. Students should usually have practised at least one substantial team role and be able to recognise the attributes and behaviours of other roles within a team. BCS recognise that there are several approaches to group development work. There are some approaches to group work that do not meet the standard required, including group discussion in class and pair programming, as these do not provide significant practice in a development team role. The team as a whole should demonstrate the ability to produce appropriate deliverables from the development lifecycle that reflect the application of knowledge and understanding of the domain and reflect the ethos of the programme, for example, a software artefact, systems design or similar.

This should be a meaningful exercise, reflective of the scale of real-life development team activity. Where this is not delivered within a single piece of work, HEIs will need to demonstrate that these criteria have been met within a limited range of areas of the programme. BCS expects the total effort involved to be significant and for integrated masters programmes seeking CEng accreditation there is an additional requirement that this should equate to at least 30 credits.

2.6.6 A note about zero-rated modules

HEIs will occasionally make use of modules which have a credit value of zero in order to meet BCS accreditation criteria. It is important that modules which are additional to the total credit value of a programme do not place undue burden on students. As a result, to be considered as addressing the BCS accreditation criteria, 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 (RITTech)

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 Technician an individual must:

- demonstrate confidence using skills defined by BCS as within the scope of the IT Profession[2];
- 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.

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 listed below
  - 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.

[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/)

3 The Process

3.1 Overview

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.

The accreditation process involves departmental visits and documentary submissions. For each visit, BCS constitutes an appropriate Panel which explores in detail the programmes being put forward, along with the context in which they are delivered. On this basis a report, with recommendations, is presented to the Committee. The Committee makes the final decision on such recommendations.

Chartered BCS members who would like to support the work of the Committee are encouraged to make themselves known to the Education Team.

3.2 Applying for accreditation

BCS has a rolling programme of visits to HEIs to consider programmes for accreditation. HEIs included in the programme are normally visited at least 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 Education Team well informed of changes they foresee with regard to any scheduled visit.

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

- the HEI discusses the process and the programmes to be considered with the Education Team at BCS
- the Education Team arranges an advisory visit by an assessor and a report is produced for use by BCS and the HEI. The report will contain information about any issues which would need to be addressed before a full visit could take place
- if the Education Team is satisfied that it is appropriate, a full visit is arranged when it can be fitted into the programme

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

Once the need and timing for a visit is established, the Education Team will request that supporting documentation (see Appendix II) is provided in an appropriate timescale.

Documentation requirements

BCS requires documentation in support of the application for accreditation. HEIs are required to submit a full set of documentation, depending on the accreditation sought, as set out in the appropriate application form (which may be found at www.bcs.org/deliver-and-teach-qualifications/university-accreditation/).

BCS requires the documentation in electronic format, either via a web portal set up by the HEI or a file sharing service. Further details may be found in the covering notes to the application form.

3.3 Visits to Higher Education Institutions

For each visit, a visiting Panel is established.

Panels will have between three and five members depending on the number of programmes being submitted for accreditation. At least one member of each Panel will have experience of industry and all members will be Chartered members of BCS. Two members of the Panel will be drawn from the AAC and the remaining from the Register of Assessors. The Panel will meet privately at a local hotel the evening before the visit and the visit will typically begin with a meeting with the students. This will be followed by a meeting with the Head of Department and senior staff to discuss

quality management and enhancement issues and then a meeting to discuss the programme related issues. The visit will conclude with informal feedback on the recommendations that the Panel will make to the AAC.

All visiting Panels will be supported by a member of the Education Team's secretariat who will brief the Panel on the current accreditation status of programmes within the department being visited. This will be accompanied by a statement of what is being requested by the department, the previous visit report or the advisory visit report in the case of a first visit and access to the documentation submitted by the department.

The Panel will use the accreditation criteria as shown in Appendix III to guide discussion on the day of the visit.

The Panel will expect to meet with a cross-section of appropriate staff as well as students during the visit. Thus, HEIs are advised to select their attendees so that full and productive discussions ensue, guided by the previously communicated agenda.

3.4 Arrangements for the visit

Departments are required to provide details of the room and the building to which the visiting Panel should report on arrival and supply maps of the campus indicating where parking is available. If parking permits are required, the department must contact the Education Team in good time to arrange the permits.

The Panel should be based in the same room (with boardroom style layout) for the day, except during the tour of facilities. A second meeting room should also be made available for the morning of the visit should the Panel decide to run parallel discussion sessions. If the room chosen is too small to accommodate a meeting with students from all programmes, further accommodation will be required for this meeting. It is essential that the base room can be locked, and it should include a telephone with an outside line. It is also helpful if the base room can be sited within easy reach of conveniences. A tour of laboratory facilities may be required, and departments should adapt any tour to concentrate on 2-3 innovative aspects of the physical resources for the programmes under review.

3.5 Joint visits with other Engineering Institutions

Some programmes may be appropriate for accreditation by both BCS and another institution or a group of institutions (e.g. through the Engineering Accreditation Board (EAB)). Joint accreditation visits can be arranged with the lead being taken by one of the institutions selected by the department(s) being visited.

If the visit is being undertaken jointly with another institution, the arrangements may be different, and more than one room may be required for all or part of the day. HEIs will be notified if this is the case.

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.

3.6 The visit report

A detailed draft report will be written following the visit, summarising discussions that took place and the views put forward by the visiting Panel and the HEI. The report serves the dual purpose of informing the AAC about the programme and informing the HEI of the views of the visiting Panel. Thus formally, the Panel makes recommendations to the AAC via the report, and it is the AAC which decides upon the outcomes.

Before the report goes to the AAC, the draft report is sent to the department for comment on factual content only. The response of the HEI to these recommendations will be taken into account by the AAC in considering the future status of the programme.

Once the report and its recommendations have been discussed by the AAC and the outcomes agreed, a full copy of the final report, stating the main terms of the decision, is emailed to the Vice-Chancellor or Principal of the HEI and also to the school or department. As the decision is not given until the AAC has approved and finalised the report, there may be a delay between the visit and the decision; in most cases this should not exceed three months.

The department can seek clarification of the outcomes of any visit from the Education Team once the decision has been communicated to the HEI. Where a department seeks support in addressing any particular matter, the Education Team may be able to offer advice or engage a member of the AAC to be of direct assistance to the department.

Items agreed by the AAC to be dealt with under a 90 Day Response will permit the department to make an appropriate documentary submission to the BCS within a 90-day period from the publication of the final report. Upon receiving the department's 90 Day Response, the visiting Panel will consider this and make recommendations to the AAC, thus allowing the AAC to discuss and take cognisance of all outcomes. Such outcomes will be communicated to the HEI and department in the same manner as above.

If there are no 90 Day Response outcomes but there are minor areas of concern which a Panel decides can be satisfactorily addressed by the department prior to the report being considered by the AAC, an action plan response may be recommended.

Where the agreed outcome was to allow the department to progress matters in its own time, these matters will remain on file. Thus, should a department take up such an invitation, the Education Team will proceed with the submission accordingly. However, should the department choose not to progress a particular matter, then the item will be noted at any subsequent visit.

3.7 Documentary submissions between visits

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

Changes made to previously accredited programmes: while it is expected that programmes will change over time, if major changes are made to a programme or its delivery during the BCS accreditation period, HEIs must notify BCS. This will also apply to programme title changes, which must be communicated to BCS in order to minimise the risk of inconvenience to Membership applicants. BCS would also appreciate notification if the HEI decides to withdraw programme(s).

Confirmation of initial recommendations: the Education Team will contact HEIs one year in advance of the deadline for receipt of documentary submissions to confirm an initial recommendation (i.e. for a programme which at the time of the visit had not produced at least 3 graduates). The deadline is usually one year after graduation of the first cohort and may need to be delayed if the programme has not produced the required 3 graduates by this time. The initial recommendation will then be considered to confirm the accreditation for the maximum 5-year period.

In your own time submissions: at an accreditation visit a Panel may invite an HEI to make a documentary submission to BCS in its own time in order for programmes to be considered for accreditation. It is the responsibility of the HEI to submit any evidence requested by the Panel should it wish to do so and no deadline is set by BCS; however, the HEI is asked to contact the Education Team in advance of making the submission for planning purposes.

The HEI should provide the additional information requested by any of the above types of submission in the form of documentary evidence which is reviewed by the visiting Panel and / or AAC members as appropriate.

BCS does not consider new titles for accreditation between visits unless:

a) the title has been included in the course list at the last visit (but is not ready for full consideration due to lack of documentation
b) the new title is a re-naming of an existing accredited programme for which the content is unchanged
c) the department is introducing a new pathway (e.g. new variant) for which the core modules are identical to an already accredited programme
d) the department is introducing a new programme which has significant overlap (at least 70%) with an already accredited programme

The guidance on format for documentary submissions is the same as for visit documentation i.e. either via a web portal or using a file sharing service.

3.8 Fees and charges

Visits will only be made to HEIs which are Educational Affiliates of BCS, and which are up to date with their subscription payments. The annual affiliate fee for educational HEIs contributes to the cost of a quinquennial visit to institutions in the UK. HEIs may use dedicated BCS logos for publicising accredited programmes. Overseas institutions should contact the Education Team for more information.

3.9 Confidentiality

BCS treats the work of the AAC as confidential. No reports or minutes of meetings will be shown to anyone with the exception of members of the Committee or of the Accreditation Panel, BCS Education Team, the Engineering Council (or representatives of the Washington Accord or EUR-ACE), representatives of the Seoul Accord, representatives of EQANIE or designated members of BCS in the case of an appeal. However, BCS has a Memorandum of Cooperation with the QAA which encourages HEIs to share their BCS accreditation reports and outcomes with all stakeholders and as such, no restrictions are placed on the use of the report by the HEI to which it is sent.

4 Outcomes

4.1 Possible outcomes

The accreditation criteria are used to help in determining the outcome of accreditation (see Appendix III*).* The outcome for each programme will be drawn from the table in Section 1.5 of these Guidelines. There are a number of types of outcome for a programme, following a visit:

1. 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 should indicate the recommended outcome if the response is satisfactory.
2. 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 outcomes numbered 3, 4 or 5 below.
3. Maximum period: The accreditation is for the maximum period of five intakes.
4. 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 is a range of reasons why a reduced term may be given, e.g. to align with existing accreditations, 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 a maximum of five intakes.
5. Not accredited: The programme fails to meet the requirements for accreditation. The reasons for failing to meet the requirements will be identified and the HEI is able to apply again at some future date.

Conditions may also be applied to programmes, for example that a specific module should be undertaken. Graduates applying for BCS Membership/Registration will be expected to inform the Membership Team that they satisfied any applicable conditions.

Programmes may be accredited for no more than five years, except that accreditation may be backdated to allow cohorts on the programme at the time it is accredited to benefit from the decision.

4.2 Programmes from which no students have yet graduated

New programmes are normally accredited only when at least one cohort of students has graduated, since it is the final standard achieved which determines whether the programme is appropriate for accreditation. Initial accreditation may be granted for new programmes which seem likely to meet the appropriate criteria, but which have not yet produced graduates. It is not a guarantee of future accreditation but is given where BCS is confident that the programme is likely to meet its objectives and to merit future consideration. In such cases, accreditation will only be granted for one period to cover a specific output of graduates. However, should a programme, other than those of one-year duration, be in its first year BCS will not normally review it.

When the first cohort of at least three students graduates, HEIs should provide BCS with a documentary submission normally containing external examiners' reports and responses, examination papers and samples of projects together with the marking sheets. Confirmation of the full period of accreditation will be based on this evidence and backdating to the first intake will be considered.

4.3 Programme title differentiation

Programmes delivered at different campuses must be clearly distinguished on the award transcript and/or certificate. Thus, programmes that are delivered at multiple sites or by distance learning, either in the UK or abroad that have the same title and cannot be distinguished from either the transcript or certificate will not be accredited.

5 Individual Route to Membership and Registration

Institutions are urged to encourage their students to become student members of BCS and their graduates to seek the appropriate grade of membership.

Having an accredited degree and/or industrial placement facilitates membership and/or registration for Chartered/Incorporated status or Registered IT Technician. In addition, having a degree accredited for CITP would not preclude becoming CEng if the post-graduation career includes appropriate further learning and experience.

5.1 Membership

The full academic requirement for Professional Membership of BCS is an accredited honours or integrated masters degree. However, a range of other academic qualifications can provide a route to BCS Membership. Information about all grades of BCS membership can be found on the BCS website at http://www.bcs.org/membership.

5.2 CEng/IEng Registration

The full academic requirement for Chartered Engineer is an accredited honours degree together with an accredited masters degree, or an accredited integrated masters degree. The full academic requirement for Incorporated Engineer is an accredited bachelors or honours degree in the computing field or a Foundation Degree in computing, plus appropriate further learning to degree level.

Just as there are routes to Professional Membership for an applicant who does not already hold an accredited award, so there are routes to Chartered and Incorporated Engineer status for an applicant whose awards are not accredited.

Dual Accreditation: All Honours degrees accredited for CEng registration from intake year 1999 meet the requirements for standard route IEng registration and Sydney Accord recognition.

5.3 Chartered IT Professional application criteria

Applicants will be assessed against the criteria set out in the CITP standard which requires evidence of:

- knowledge and experience gained through formal and informal education and training and the ability to apply fundamental principles in a wide and often unpredictable range of contexts
- the ability to perform an extensive range and variety of complex technical and/or professional work activities
- a breadth of knowledge of IT that allows them to communicate and work with specialists across the IT profession
- the ability to understand and appreciate the relationship between their own discipline and wider customer/organisational requirements
- the leadership qualities to influence and build appropriate and effective business relationships that promote collaboration between stakeholders who have diverse objectives

Programmes accredited for Full CITP will fulfil the requirement to demonstrate breadth of knowledge. Applicants with partially accredited programmes will need to provide additional evidence – this could be through other academic qualifications, training, or experience.

5.4 Registered IT Technician application criteria

Being assessed successfully against the competence criteria set out in the BCS standard for Registered IT Technician as part of a BCS accredited Degree Apprenticeship, accredited industrial placement or accredited Foundation Degree will allow entry to the Register of IT Technicians without further assessment. Application for registration must be made within 12 months from the date of assessment. Applicants to the Register will be expected to provide documentary evidence confirming attainment of the BCS standard and the date on which the assessment was completed.

Appendix I

Multiple site delivery, franchised study, validated study, study and work placements and distance learning

Introduction

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.

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).

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.

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.

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.

In each of the above arrangements, the processes of accreditation 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, thus 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 indigenous professional computing society for such an accreditation visit to proceed. Early advice should be sought from the Education Team (educ@bcs.uk) by HEIs seeking accreditation of programmes delivered by the arrangements above.

Multiple site delivery

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 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 programmes

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 and work placements

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

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 Education 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.

A. Overview

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.

B. HEI submission

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.

Any programmes which are delivered via the distance learning method should complete an additional application form, available from the Education Team educ@bcs.uk.

Appendix II

HEI Application Forms

The HEI accreditation application form and the Registered IT Technician application form can be downloaded in either Microsoft Word or PDF format.

As far as possible the HEI accreditation application form has been designed to allow institutions to present information in a similar format to that required by the Quality Assurance Agency (QAA) as Programme Specifications documents.

This is particularly the case with Section B of the application form relating to Programme Issues. BCS does, however, require specific additional information not requested by the QAA and you must ensure that each of the questions in the application form is addressed.

Appendix III

BCS accreditation criteria

Quality assurance and enhancement	Threshold			Commendable / shortcomings / general comments	Additional comments during visit
Section 1 **Note:** Individual programmes not meeting an aspect will be identified explicitly, with that aspect being rated "at threshold". Should the number of programmes so identified be significant then that aspect will be rated at "below threshold" overall. **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 **1.4** **Programmes are delivered and students supported**, employing appropriate resources in terms of staff, learning materials, equipment and accommodation **1.5** **Support of student engagement and development** takes cognisance of individual ability and evidenced prior achievement **1.6** **HEI regulations governing awards**, as gauged through student achievement, properly underpin the fulfilment of the requirements of the accreditation sought **1.7** **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 **1.8** **Quality assurance and enhancement** processes are effective in supporting the delivery and evolution of programmes **1.9** **Any off-site learning and assessment activities of a programme** are handled appropriately including • study and work placements • franchised study • validated awards studied at another location **1.10** **Employability skills are developed** throughout the course of study and students are supported in their professional development	Above	At	Below		

Programme based issues

Programme title	Threshold			Commendable / shortcomings / general comments	Additional comments during visit
Section 2 **Core requirements for accreditation of honours programmes (and generalist masters programmes)**	Above	At	Below		
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					
2.1.1 Knowledge and understanding of 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 Recognise and analyse criteria and specifications appropriate to specific problems and plan strategies for their solution					
2.1.4 Analyse the extent to which a computer-based system meets the criteria defined for its current use and future development					
2.1.5 Deploy appropriate theory, practices and tools for the specification, design, implementation and evaluation of computer-based systems					
2.1.6 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					
2.1.7 Knowledge and understanding of the commercial and economic context of the development, use and maintenance of information systems					
2.1.8 Knowledge and understanding of the management techniques which may be used to achieve objectives within a computing context					
2.1.9 Knowledge and understanding of information security issues in relation to the design, development and the use of information systems					

Programme title	Threshold			Commendable / shortcomings / general comments	Additional comments during visit
Computing-related practical abilities **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 Recognise any risks** or safety aspects that may be involved in the operation of computing and information systems within a given context **2.2.4 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 **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; these include: 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	Above	At	Below		

Programme title	Threshold			Commendable / shortcomings / general comments	Additional comments during visit
Section 3 **Additional requirements for CITP** Graduates from all accredited CITP undergraduate and generalist masters programmes should have been assessed on the following abilities: **Computing-related cognitive abilities** **3.1.1 Knowledge and understanding of the methods and issues** involved in deploying systems to meet business goals **3.1.2 Knowledge and understanding of methods, techniques and tools for** information modelling, management and security **3.1.3 Knowledge and understanding of systems architecture** and related technologies for developing information systems **3.1.4 Knowledge and understanding of mathematical and/or statistical principles** appropriate to the nature of the programme **Computing-related practical abilities** **3.2.1 Use appropriate theoretical and practical processes** to specify and deploy, verify and maintain information systems, including working with technical uncertainty **3.2.2 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 **3.2.3 Apply the principles, methods and tools of systems design** to develop information systems that meet business needs	Above	At	Below		

Programme title	Threshold			Commendable / shortcomings / general comments	Additional comments during visit
Section 4 **Additional requirements for CEng** **4.0 HEI compensation and condonement regulations** conform to the Engineering Council rules for CEng accreditation Graduates from all accredited CEng undergraduate programmes should have been assessed on the following abilities: **Computing-related cognitive abilities** **4.1.1 Knowledge and/or understanding of the appropriate use of engineering principles** in the creation, use, support and decommissioning of information systems for the solution of practical problems, founded on appropriate technological disciplines **4.1.2 Knowledge and understanding of the mathematical and statistical principles necessary** to underpin their programme of study and the ability to apply mathematical and statistical methods, tools and notations proficiently in the analysis and solution to problems **4.1.3 Knowledge and understanding of the principles of computational modelling** used for the comprehension of engineering phenomena **Computing-related practical abilities** **4.2.1 Use appropriate theoretical and practical processes** to specify, design, implement, verify and maintain computer-based systems, including working with technical uncertainty **4.2.2 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 **4.2.3 Apply the principles** of appropriate supporting engineering and scientific disciplines	Above	At	Below		

Programme title	Threshold			Commendable / shortcomings / general comments	Additional comments during visit
Section 5 **Supplementary requirements for CEng at integrated masters level** **5.1 Graduates should have been assessed on their demonstration of the following criteria,** commonly met by a piece of team-based major (30 credit) project work at level 6 or above (or equivalent) • **Their ability in applying 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 • **Awareness of wider customer contexts** and the identification of problems that such contexts might deliver • **The ability to work co-operatively (for example, as a team)** to deliver a significant piece of work • **Critical self evaluation of the process**	Above	At	Below		

Programme title	Threshold			Commendable / shortcomings / general comments	Additional comments during visit
Section 6 **Requirements for IEng** **6.0 HEI compensation and condonement regulations** conform to the Engineering Council rules for IEng accreditation Graduates from all accredited IEng programmes should have been assessed on the following abilities: **Computing-related cognitive abilities** **6.1.1 Knowledge and understanding of** essential facts, concepts, principles and theories relating to computing and computer applications as appropriate to the programme of study **6.1.2 Knowledge of the scientific principles** underpinning relevant current technologies and their evolution **6.1.3 Knowledge of the mathematics and statistics necessary** to support the application of key engineering principles **6.1.4 Understanding the principles** of managing computing processes **6.1.5 Knowledge of the commercial and economic** context of the development use and maintenance of computer-based systems **6.1.6 Knowledge of the management techniques** which may be used to achieve objectives within a computing context **Computing-related practical abilities** **6.2.1 Deploy appropriate theory,** practices and tools for the specification, design and implementation of computer-based systems according to customer & user needs and use innovation and creativity in a practical and social context **6.2.2 Evaluate systems** in terms of general quality attributes and possible trade-offs presented within the given problem **6.2.3 Recognise and analyse** criteria and specifications appropriate to specific problems and plan strategies for their solution **6.2.4 Model and analyse the extent** to which a computer-based system meets the criteria defined for its current use and future development	Above	At	Below		

Programme title	Threshold			Commendable / shortcomings / general comments	Additional comments during visit
Section 6 **Requirements for IEng cont.** **6.2.5 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 **6.2.6 Recognise any risks or safety aspects** that may be involved in the operation of computing and information systems within a given context **6.2.7 Deploy effectively the tools** used for the construction and documentation of computer applications and to use and apply information from technical literature	Above	At	Below		

Programme title	Threshold			Commendable / shortcomings / general comments	Additional comments during visit
Section 7 **Core requirements for accreditation of specialist masters programmes** **Transferable skills** **7.1.1 Carry out a critical review** of the literature, current developments and available software as well as the associated software processes **7.1.2 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 **7.1.3 Recognise and be able to respond** in an appropriate way to opportunities for innovation **7.1.4 Participate effectively** in the peer review process **7.1.5 Undertake risk management** associated with a range of activities **7.1.6 Use appropriate processes** to specify, design, implement, verify and maintain computer-based systems, including working with technical uncertainty **7.1.7 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 **7.1.8 Apply the principles** of appropriate supporting disciplines **7.1.9 An ability to work as a member of a development team** recognising the different roles within a team and different ways of organising teams	Above	At	Below		

Programme title	Threshold			Commendable / shortcomings / general comments	Additional comments during visit
Section 8 **Specialist Masters level additional requirements for CITP**	Above	At	Below		
8.0 The programme contains sufficient computing content, as set out in table 1.5 of the Guidelines					
Graduates should have been assessed on the following abilities:					
Computing-related cognitive abilities					
8.1.1 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					
8.1.2 Demonstrate a comprehensive understanding of the essential principles and 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					
8.1.3 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					
8.2.1 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					
8.2.2 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 a self-critical evaluation of effectiveness but also a sense of vision about the direction of developments in aspects of the discipline					

Programme title	Threshold			Commendable / shortcomings / general comments	Additional comments during visit
Section 9 **Specialist Masters level additional requirements for CEng** **9.0 HEI compensation and condonement regulations** conform to the Engineering Council rules for CEng accreditation **Computing-related cognitive abilities** **9.1.1 Systematic understanding of knowledge** and a critical awareness of current problems and/or new insights in the development and implementation of systems, much of which is at, or informed by, the forefront of their field of study **9.1.2 Comprehensive understanding** of the state of the art techniques and methodologies for developing systems **9.1.3 Understand and be able to participate** within the legal, social, ethical and professional framework as professionals in systems, software or information engineering **Computing-related practical abilities** **9.2.1 Develop and apply new technologies** **9.2.2 Show originality and innovation** in the application of knowledge and techniques for developing systems **9.2.3 Make general evaluation of commercial risk** through some understanding of the basis of such risks	Above	At	Below		

Programme title	Threshold			Commendable / shortcomings / general comments	Additional comments during visit
Section 10 **Project requirements**	Above	At	Below		
10.1.1 **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					
10.1.2 **The project report** must meet the requirements set out in section 2.5 of the Guidelines					
10.1.3 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 (or equivalent) 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 (or equivalent) The individual project within a **specialist masters** degree should be a piece of work of at least 60 credit points at level 7 (or equivalent) 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 (or equivalent)					
10.1.4 **All projects should reflect** the title and the aims and learning outcomes which characterise the programme as set out in the programme specification					
10.1.5 **A project undertaken at masters level** should reflect the ethos of advanced study and scholarship appropriate to a masters degree					
10.1.6 **The project must be passed without compensation**					
10.1.7 **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					

Panel recommendations

The final Panel recommendations will be achieved by consensus and decided during the private BCS Panel meeting at the end of the accreditation visit.

A Panel would normally expect to see every aspect *at* or *above threshold* in all sections in order to gain accreditation.

- **Maximum accreditation period of 5 years:** All sections of the Accreditation Criteria must score an overall section score of 'At Threshold' to be recommended for accreditation for the full five years
- **Reduced period of accreditation:** A reduced period of accreditation (see section 4.1 of the Guidelines) will be recommended if any of the sections fail to meet the 'At Threshold' score. Any reduced period recommendation should indicate whether the Panel recommend a follow-up visit or a documentary submission
- **Programme conditions:** A 'below threshold' score can be negated by imposing a condition
- **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 should indicate the recommended outcome if the response is satisfactory
- **90 Day Response:** This is recommended when a Panel believes that areas of concern can be satisfactorily addressed within the 90-day time period. The Panel should indicate the recommended outcome if the response is satisfactory

The accreditation which can be achieved will be one of the following:

For integrated masters degrees:
- CITP
- CITP and Full CEng

For joint integrated masters degrees:
- CITP

For undergraduate single honours degrees:
- CITP
- CITP and Partial CEng

For undergraduate joint honours degrees:
- Partial CITP

For undergraduate ordinary degrees:
- IEng

For foundation degrees:
- Partial IEng

For specialist masters degrees:
- Partial CITP
- Partial CITP and Partial CEng (Further Learning)

For generalist masters degrees:
- Partial CITP

For industrial placements, Degree Apprenticeship and Foundation Degree programmes:
- RITTech

A Panel may identify examples of commendable practice and/or Practice Highlights. Practice Highlights will be examples that are exemplary in practice, potentially portable to other HEIs, that are evidentially successful.

Appendix IV: 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 by BCS.

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 of an academic programme of study in connection with the award of Chartered status or RITTech by BCS.

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.

BCS Education 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.

BCS Education 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.

Appendix V

Engineering Council - Compensation and Condonement

Introduction

The Engineering Council released the following new Compensation Regulations in November 2018, with which, HEIs will be expected to comply by the September 2022 intake (see engc.org.uk/eab).

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 will be providing some further guidance on adoption of the new regulations which will be found here engc.org.uk/eab.

A summary of these is below:

a) The new compensation regulations will not apply to Foundation years of Bachelor's and Integrated Master's programmes, or to the first year of Scottish Bachelor's and Integrated Master's programmes.
b) The statement that: 'No condonement of modules delivering AHEP Learning Outcomes is allowed' specifies that neither core nor optional engineering modules can be condoned. Condonement is only possible for non-engineering modules offered within the programme that do not cover any AHEP Learning Outcomes (for example a language taken as an 'outside option').

Note:

This document is intended to provide guidance to those who are considering whether to submit courses for accreditation by BCS. Please read the Guidelines carefully to ensure that any courses to be submitted are likely to meet the criteria. You can obtain advice from:

The Education Team

Email: educ@bcs.uk

Telephone: +44 (0)1793 417417