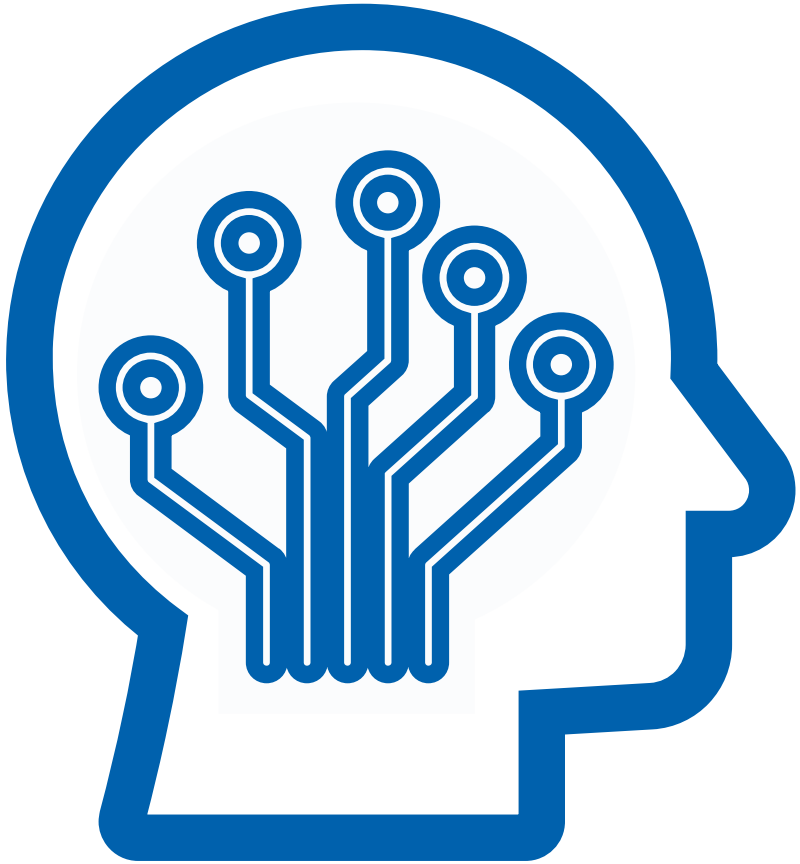
Engineering Council

The Accreditation of Higher Education Programmes (AHEP)



Fourth edition

Published August 2020

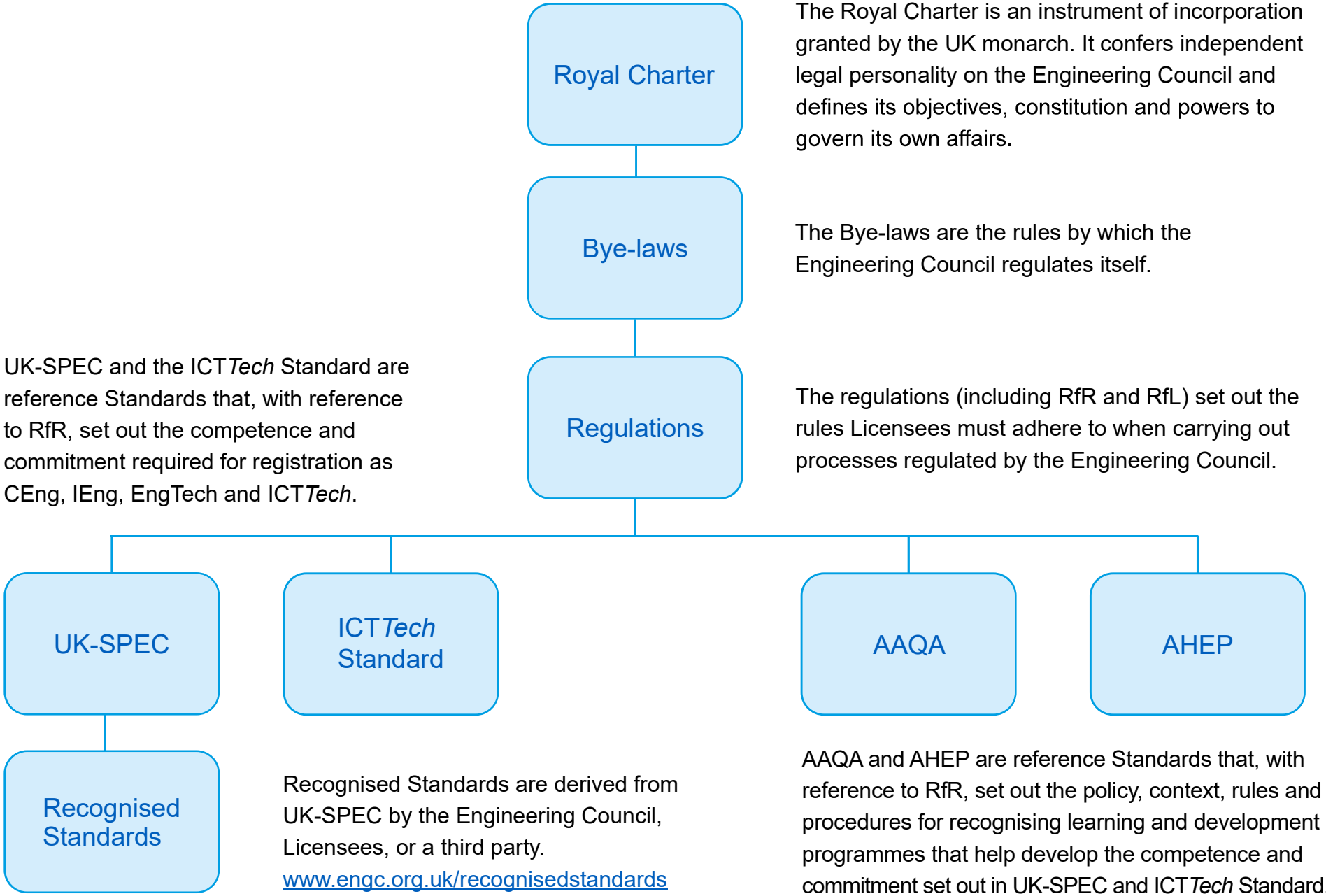
Hierarchy of regulations and standards

The Engineering Council is the UK's regulatory body for the engineering profession. It operates under a Royal Charter and is governed by a Board that represents UK Licensees as well as individuals from industries and sectors with an interest in the regulation of the profession.

This document is one in a series of closely related publications:

- **Regulations for Registration (RfR)**
- **Regulations for Licensing (RfL)**
- **The UK Standard for Professional Engineering Competence and Commitment (UK-SPEC)**
- **Information and Communications Technology Technician Standard (ICT*Tech* Standard)**
- **Approval and Accreditation of Qualifications and Apprenticeships (AAQA)**
- **Accreditation of Higher Education Programmes (AHEP)**

The Engineering Council publishes these documents on behalf of the UK engineering profession, with whom they were developed and are kept under review. The relationship between these publications is:



The Engineering Council also publishes policy statements, guidance for institutions and guidance for individuals. These, along with all the publications listed above, are available on the Engineering Council website: www.engc.org.uk

Contents

Edition 4.1: minor revisions to clarify the minimum level at which each learning outcome must be achieved, pages 26-37, September 2022.
Edition 4.2: minor revisions to reflect updates the Regulations to Registration (RfR), page 15, March 2025.

Foreword

Engineers and Technicians are concerned with the art and practice of changing our world. Responding to the needs of society and business, they solve complex challenges and in doing so enhance welfare, health and safety whilst paying due regard to the environment.

Society places great faith in the engineering profession, trusting its members to regulate themselves. By achieving and demonstrating professional competence and commitment for the purpose of registration, engineers and technicians demonstrate that they are worthy of that trust.

This document, the Accreditation of Higher Education Programmes (AHEP), forms part of the standard used by the UK engineering profession to assess the competence and commitment of individual engineers and technicians. It was developed collaboratively, in consultation with engineers representing the breadth of the profession: from industry, academia and many different disciplines and specialisms.

The AHEP Standard was first published by the Engineering Council in 2004 and since then has been widely used by HEIs, individual academics and Licensees. It has developed in consultation with the profession, including input from employers in industry and engineering academics. It has enabled the development of diverse provision, without losing sight of the required skills, knowledge and understanding that tomorrow's engineers will need.

Welcome

The purpose of AHEP

This document sets out the requirements for the Accreditation of Higher Education Programmes (AHEP).

The primary purpose of AHEP is to set out the required overall standard to be achieved by engineering higher education programmes if they are to be accredited by the Engineering Council. This document also:

- explains the benefits of accreditation of higher education programmes
- identifies what indicators are considered when judging whether a programme should be accredited
- sets out the learning outcomes that programmes must meet to become accredited
- outlines how to apply for accreditation
- outlines how the Engineering Council ensures that accredited programmes are internationally recognised.

When reviewing a higher education programme for the purpose of accreditation, Licensees assess whether that programme provides some, or all, of the knowledge and understanding that underpin eventual registration in the following registration categories:

- Incorporated Engineer (IEng)
- Chartered Engineer (CEng)

Wherever it appears in this document, **accreditation** refers to the accreditation of programmes delivered within higher education.For a full and current list of accredited degrees please see: www.engc.org.uk/courses

Who is AHEP for?

Many different groups will find this document useful. However, it has been written primarily for:

- Licensees undertaking accreditation reviews
- Higher Education Institutions (HEIs) that may wish to seek accreditation for one or more of their programmes.

For degree apprenticeships, as well as education and training programmes which are not delivered by HEIs, see the Engineering Council's Approval and Accreditation of Qualifications and Apprenticeships (AAQA) Standard.

Licensee

Throughout this document the term ‘Licensee’ is used to describe the engineering institutions that have been licensed by the Engineering Council Board to assess individuals for professional registration. To become Licensees organisations must pass a rigorous process demonstrating, to the satisfaction of the Engineering Council Board, that they are competent to perform this task and to regulate the conduct of their members. Additionally, Licensees can be licensed to approve or accredit programmes of learning and competence development to specific standards.

Licensees are sometimes known informally as Professional Engineering Institutions, or PEIs. For a full and current list of Licensees please see: www.engc.org.uk/licensees

Glossary

At the end of AHEP there is a glossary that explains some of the terms we use.

Key information

Throughout this document some key information, terms and crucial points will be picked out in boxed text like this to help navigation.

Introduction

All engineering students deserve a world-class education that develops industry-relevant skills.

Accreditation of degree programmes helps to:

- Ensure that UK engineering education provides those industry-relevant skills
- Draw students towards a career in the engineering profession
- Demonstrate, both nationally and internationally, the high standard of UK engineering education
- Provides a basis for HEIs to review their programmes and develop excellence in delivery and content

The criteria and process of accreditation are regularly reviewed internationally. The Engineering Council is a full member of the Sydney and Washington Accords, demonstrating that its accreditation process is compatible with the standards of the International Engineering Alliance (IEA). This also demonstrates that the learning outcomes set by the Engineering Council meet or exceed the Graduate Attributes thresholds published by the IEA.

Alignment has also been demonstrated with the European Network for Accreditation of Engineering Education (ENAEE)’s EUR-ACE® framework, resulting in the Engineering Council being authorised to award the EUR-ACE® label to engineering programmes accredited for CEng registration. The learning outcomes remain aligned with international standards, including the Washington and Sydney Accords and EUR-ACE® Framework Standards and Guidelines (EAFSG). The levels of degree programmes that may be accredited have been referenced to ISCED (International Standard Classification of Education). Further details about

international recognition for accredited degrees can be found on page 9 and page 38.

Engineers have a crucial role to play in helping to solve the world's problems, ensuring the benefits of innovation and progress are shared equitably and do not compromise the natural environment or deplete natural resources to the detriment of future generations. The ambitions of countries around the world to achieve 'net zero' carbon emissions can only be met through the development of innovative 'clean' technologies. Similarly, engineering and technological innovation is central to delivering the United Nations Sustainable Development Goals.

Engineering graduates need a range of skills in order to create, develop or apply new technologies. This document defines these attributes though learning outcomes for each type of degree that can be accredited.

Bachelors (Honours) degrees which are accredited as fully meeting the academic requirement for IEng registration and partially meeting the academic requirement for CEng registration are aligned with the Washington Accord standard. The high academic standing of the Integrated Masters (MEng) is set out through higher-level learning outcomes. Additionally, learning outcomes have been set out on pages 26-37 for Foundation degrees (and equivalent qualifications) and Bachelors (Honours) Top-up degrees (IEng).

The learning outcomes in this document may be a useful reference when assessing the knowledge and understanding of an individual who does not hold an accredited degree.

Differences in this edition

The learning outcomes have been revised for this fourth edition of AHEP. They now have a sharper focus on inclusive design and innovation, and the coverage of areas such as sustainability and ethics. The coverage of equality, diversity and inclusion is also strengthened to reflect the importance of these matters to society as a whole and within the engineering profession. To reflect a reality of modern society, there is now explicit treatment of security and the mitigation of security risks.

This fourth edition of AHEP has reduced the total number of learning outcomes in order to focus attention on core areas, eliminate duplication and demonstrate progression between academic levels of study.

The learning outcomes continue to demand a substantial grounding in engineering principles, science and mathematics, and well-developed quantitative analytical skills – commensurate with the level of study.

Accreditation

What is accreditation?

Accreditation of education programmes, by recognised professional and statutory bodies, is a mark of assurance that the programmes meet the standards set by the relevant profession.

The accreditation process is essentially one of peer review; it is applied to individual programmes of learning, not to the department or HEI overall.

In the UK, the Engineering Council sets and maintains the standards for the engineering profession and sets the overall requirements for accreditation. The Engineering Council licenses around 40 engineering institutions (Licensees) to assess individuals for professional registration. Some Licensees are also licensed to accredit programmes of learning within these requirements.

Each Licensee interprets the requirements, as appropriate, for their own sector of the profession. Licensees use the accreditation process to assess whether specific educational programmes, delivered at a specific site or sites, provide some, or all, of the underpinning knowledge and understanding for eventual professional registration in a particular category (such as CEng or IEng). It is the Licensee which accredits the programme.

Once a programme is accredited it usually retains accreditation for up to five years.

The Engineering Council also maintains publicly available lists of:

- The Licensees licensed to undertake accreditation
- Accredited programmes which can be found at: www.engc.org.uk/courses

The benefits of accreditation

Benefits for individuals

International recognition

Accreditation is an accepted and rigorous process that commands respect both in the UK and internationally.

Degree selection

Accreditation helps students, as well as their parents and advisers, to choose degree programmes of the standard recognised by the engineering profession.

Employment market advantage

Accreditation confers advantage to graduates when they are seeking employment; some employers require graduation from an accredited programme as a minimum qualification.

Professional registration

An accredited degree can be an advantage when applying for professional registration as an IEng or CEng. As accreditation confirms that a degree develops underpinning knowledge and understanding, it can also be beneficial if graduates seek interim registration while they develop the competence required for a professional registration title.

Benefits for HEIs

Programme assessment

Accreditation is a developmental process which gives HEIs a structured mechanism to assess, evaluate and improve the quality of their programmes. It offers the opportunity for a continuing dialogue between Licensees and HEIs, rather than placing all the emphasis on the periodic accreditation exercise.

Alignment with QAA standards

An important development in 2006 was the UK Quality Assurance Agency for Higher Education (QAA) adopting the Engineering Council's standards for accredited engineering degrees as the subject benchmark statement for engineering. This alignment was strongly supported by the academic community. Aligning Engineering Council standards with QAA standards reduces the regulatory burden on the higher education sector.

International recognition

In an increasingly global market for engineering education, having a programme recognised under an international accord offers potential benefits to HEIs including:

- Programmes are more attractive to students who value an internationally recognised qualification, particularly those who may want to work in countries where 'engineer' is a legally protected title
- Assurance that a degree meets international standards
- Graduates may be more employable, helping with league table ratings

For more information about accreditation and international recognition see page 38.

Benefits for employers

International recognition

Accredited qualifications may be helpful or necessary for employees to work in some jurisdictions.

Assurance of knowledge and understanding

Accredited qualifications develop underpinning knowledge and understanding in line with requirements set by industry.

Competitive advantage

Employing staff who hold accredited qualifications and/or registration titles can be advantageous in demonstrating to clients and regulators that employees are suitably qualified to undertake work.

Benefits for society

Engineers with professional levels of knowledge and understanding

Engineers who hold accredited qualifications will have demonstrated the underpinning knowledge and understanding required to work to a professional standard, including awareness of ethical, environmental and societal considerations.

Degree quality

Accreditation ensures that degree programmes meet the standard set by the engineering profession.

Programme innovation

HEIs are encouraged to develop innovative degree programmes in response to industry needs. The Engineering Council does not favour any particular approach to teaching, learning or assessment.

The accreditation process supports innovation in both the delivery and content of engineering degrees. All HEIs are encouraged to contact the relevant accrediting Licensee for advice on meeting accreditation requirements at an early stage when developing a programme. This applies to all programmes, but is particularly important when planning something new and innovative.

Innovative programmes may include a range of providers, the involvement of several departments, or a specific approach to industrial engagement or curriculum delivery.

Encouraging dialogue

HEIs are encouraged to talk to Licensees early, including to seek guidance when proposing a new programme, and to maintain dialogue up to and beyond accreditation.

Licensees can advise on:

- Whether the programme is appropriate for accreditation
- Whether the Licensee has contextualised (specified or expanded on) the Engineering Council Standards for their own specialism.

Characteristics of an accredited programme

The standards that must be met for an educational programme to be accredited are set out on page 23-25, and are rooted in UK-SPEC.

Further information about regulatory requirements is available in the Engineering Council's Regulations for Registration (RfR).

Learning outcomes

To achieve accreditation a programme must deliver the learning outcomes which the Licensee has specified. The learning outcomes specified by each Licensee are derived from the generic learning outcomes, set out on page 26-37, that apply to all accredited engineering degree programmes.

Each type of accredited degree provides a solid foundation in the principles of engineering relevant to the discipline specialism. What were previously referred to as 'additional general skills' have been integrated within the five engineering-specific areas of learning. These are:

- Science and mathematics
- Engineering analysis
- Design and innovation
- The Engineer and society
- Engineering practice

The level at which the learning outcomes will be delivered is that expected from the relevant qualifications as they are described in The Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies, published by QAA. The frameworks include qualification descriptors for:

- Foundation degrees,
- Bachelors degrees,
- Bachelors degrees with honours,
- Masters degrees including the Integrated Masters, and
- Doctoral degrees.

Learning outcomes and competence and commitment

Accredited engineering and technology programmes develop underpinning knowledge and understanding requirements for professional registration. Therefore, the learning outcomes should be read in the context of the generic statements of competence and commitment for IEng and CEng in UK-SPEC.

How many learning outcomes must a graduate meet?

To be recognised as having an accredited degree, a graduate must achieve all the prescribed learning outcomes for the programme. Each type of accredited programme provides either:

- the required underpinning knowledge and understanding for specific registration titles, or
- a defined subset of the required underpinning knowledge and understanding, with the programme accredited as requiring or being further learning towards a registration title.

While all learning outcomes in a programme must be delivered and assessed in order to achieve accreditation, the weighting of learning outcomes may be different in each programme. Some may be weighted in favour of engineering practice while others may be weighted in favour of science and mathematics.

Holistic delivery

The listing of different learning outcomes within a programme does not imply a compartmentalised or linear approach to learning and teaching. Throughout each programme, different learning outcomes are likely to be delivered concurrently through, for example, project work. The process of accreditation will include an assessment of whether graduates are achieving these outcomes.

Links to professional practice

Accredited degree programmes should feature student engagement with relevant scholarship, research, and/or professional practice. An accreditation panel will expect to see evidence of ongoing industry involvement in programme design and delivery.

Diversity and inclusion

Departments delivering accredited degrees are expected to promote equality, diversity and inclusion in line with applicable national regulatory frameworks, as well as embedding inclusive design within the curriculum where relevant.

Sustainability

Sustainability of engineering practice is an issue of concern for the profession and HEIs are encouraged to make use of the United Nations Sustainable Development Goals, and Engineering Council Guidance on Sustainability in programme design and delivery. The Engineering Council guidance can be found at: www.engc.org.uk/sustainability

The Engineering Council publishes guidance on a range of engineering-related topics which may be useful to educators and students. Guidance on topics including sustainability, risk, ethics and security can be found at: www.engc.org.uk/standards-guidance/guidance

Qualifications that meet the underpinning knowledge and understanding requirements

The types of qualification that can meet the knowledge and understanding requirements for registration are shown in Table 1, below. The learning outcomes expected from the six types of degree are shown are shown on Table 2, on page 13. The characteristics that define accredited degree programmes are set out on pages 23-25.

Any of these programmes may be accredited for delivery in a variety of modes, including for delivery within a degree apprenticeship. Each new mode of study (including degree apprenticeships) will need to be accredited separately, in line with the regulations set out in this Standard. However, consideration can also be given to additional accreditation or approval of the degree apprenticeship as delivering some, or all, of the competences required for registration, as set out in Approval and Accreditation of Qualifications and Apprenticeships (AAQA): www.engc.org.uk/aaqa

Table 1: Qualifications that meet the knowledge and understanding requirements for Incorporated Engineer and Chartered Engineer

Incorporated Engineer (IEng)	**Chartered Engineer (CEng)**
An accredited Bachelors or Honours degree in engineering or technology	An accredited integrated Masters (eg MEng) degree
A Higher National Diploma or an accredited Foundation Degree in engineering or technology **plus** appropriate further learning to degree level, for example a top-up degree	An accredited Bachelors degree with Honours in engineering or technology **plus** either: • An appropriate Masters degree or Doctorate accredited by a Licensee, or • Appropriate further learning to Masters level
A qualification or apprenticeship at the appropriate level that has been approved or accredited in line with AAQA	A qualification or apprenticeship at the appropriate level that has been approved or accredited in line with AAQA

Table 2: The six types of degree

Qualification	ISCED Level
Foundation degrees and equivalent qualifications accredited as **partially meeting** the underpinning knowledge and understanding requirement for **IEng** registration	5
Bachelors and Bachelors (Hons) degrees accredited as **fully meeting** the underpinning knowledge and understanding requirement for **IEng** registration	6
Bachelors (Hons) degrees accredited as **partially meeting** the underpinning knowledge and understanding requirement for **CEng** registration	6
Integrated Masters (eg MEng) degrees accredited as **fully meeting** the underpinning knowledge and understanding requirement for **CEng** registration	7
Other Masters degrees accredited as **meeting** the **further learning** requirement for the underpinning knowledge and understanding requirement for **CEng** registration	7
Doctoral programmes accredited as **meeting** the **further learning** requirement for the underpinning knowledge and understanding requirement for **CEng** registration	8

Information reviewed during accreditation

In considering applications for accreditation, Licensees shall:

- Accredit only programmes which provide awards granted on the basis of clearly-defined learning outcomes
- Ensure that the programme is at the appropriate level in the applicable UK qualifications framework or at an equivalent level within an appropriate international framework
- Monitor the accuracy of the awarding institution's published information about the programme's approved or accredited status and registration
- Visit the awarding institution as part of the assessment if necessary, and
- Ensure that where recognition will attest to acquisition of competence, the programme covers the relevant competence standards in UK-SPEC or AAQA

Further information about regulatory requirements is available in RfR.

In making a judgment, Licensees shall consider evidence from a range of indicators. These shall include:

- The learning outcomes of the programme(s)
- The teaching and learning processes
- The assessment strategies employed
- The human, physical and material resources involved
- The HEI's internal regulations regarding progression and the award of degrees
- Quality assurance arrangements
- Feedback from meetings with students
- How any previous accreditation recommendations and requirements have been dealt with

- Entry to the programme and how cohort entry extremes will be supported
- The awarding institution's regulations regarding progression and the award of degrees

The Licensee will normally expect to see the following evidence for each programme presented for accreditation:

- Programme specification or equivalent showing programme aims, learning outcomes and curriculum structure
- A mapping or explanation showing where and how each AHEP learning outcome is assessed within the programme
- For each unit or module that contributes to the achievement of AHEP learning outcomes:
  - the unit or module specification
  - examination papers and coursework assessments with marking schemes/guides
  - samples of marked student work covering the full range of student achievement
- Where programmes include major projects:
  - student project handbook(s)
  - a representative sample of project reports
  - the completed marking scheme or feedback sheet for each project
- Information about industry involvement in programme design and delivery
- Information about student and staffing numbers, outline CVs for all staff who teach on the programme to show their highest academic qualifications and teaching qualifications
- Information about specialist practical facilities used by students on the programme, if applicable
- Information about library resources (print and digital) available to students on the programme
- The academic regulations for student progression and award of a degree (to evidence compliance with Engineering Council policy on Compensation and Condonement - see page 15)
- Arrangements for student academic and pastoral support
- Quantitative data showing student progression rates from entry through each level or year of study to graduation
- Information about the operation of quality assurance processes at programme level, in particular the arrangements for:
  - programme approval
  - annual monitoring
  - periodic review
- Information about student involvement in quality assurance and enhancement processes
- For UK programmes: external examiner reports and responses from the department for the three most recent years
- Evidence that the programme is at an appropriate level commensurate with ISCED and the Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies and ISCED

The Engineering Council and the Licensees are committed to minimising the administrative burden of accreditation, for example by using data collected by the HEI for other purposes.

Note: an accreditation panel is only able to recommend that accreditation is backdated to earlier entry years if samples of student work are reviewed for all intakes accredited. HEIs should retain suitable samples of work for this purpose. All samples of student work should be suitably anonymised.

Assessment

Assessment should be designed to minimise opportunities for students to commit academic misconduct, including plagiarism, self-plagiarism and contract cheating. Wherever possible, a suitable variety of assessment methods should be used to minimise opportunities for students to incorporate plagiarised work, either within the level of study or across levels. Policies and procedures relevant to academic integrity should be clear, accessible, and actively promoted rather than simply made available.

Compensation and condonement

Many UK HEI examination board's rules include some allowance for compensation or condonement[1] of limited failure in one or more modules, where this is compensated by strong performance across the programme as a whole. The Regulations for Registration (RfR) requires accrediting Licensees to consider the HEI's regulations regarding progression. They may impose constraints on an accreditation decision as a result of this.

The Engineering Council defines compensation as:

"The practice of allowing marginal failure (ie 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."

The Engineering Council has published a Guidance Note on Compensation and Condonement which can be found under 'useful documents' at: www.engc.org.uk/ahep

RfR, paragraph 46

In the consideration of the accreditation of engineering degree programmes, Licensees shall ensure that, regardless of options taken and allowing for the maximum number of credits permitted as failed by University regulations, all students will achieve all AHEP learning outcomes.

- Evidence that all AHEP learning outcomes are met by all variants of each programme must be provided before accreditation can be granted.
- No condonement of modules delivering AHEP learning outcomes is allowed.
- 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.
- Major individual and group-based project modules must not be compensated.

[1] There are no consistent definitions of the terms 'compensation' and 'condonement' across UK HEIs, and they are often confused. The Engineering Council therefore adopts a similar definition to that used by QAA and the Higher Education Academy (HEA), and, for the avoidance of doubt, includes this definition in this statement.

- The minimum module mark for which compensation is allowed is no more than ten percentage points below the nominal module pass mark (or equivalent if a grade-based marking scheme is used).

The key consideration in these rules is to ensure that graduates of accredited engineering degree programmes have met all the programme learning outcomes specified in this Standard.

Alternatives to campus-based provision

Programmes that are not campus-based may also be accredited. Examples of such programmes include:

- Distance learning programmes
- Degree Apprenticeships
- Other work-based degrees

The same accreditation aims and standards apply as for any other types of degree programme. Assessment of assignments must be at the same standard as any equivalent programme being delivered by the HEI. The general provisions regarding such accreditation are set out on this page, followed by specific provisions.

Any quality systems which are purpose built for the programme type must be assessed for effectiveness.

Licensees should notify the HEI as early as possible about any additional or different requirements for information, evidence or visiting arrangements compared to campus-based provision.

Licensees must ensure that their accreditors are properly trained to carry out accreditation of the type of programme under review. It should be stressed that the primary aim is the achievement of the learning outcomes.

HEIs should specify in their accreditation submission document the maximum length of time permitted for completion of their programme(s). Licensees may specify that students must graduate within a prescribed period. This may be the same or less than that prescribed by the HEI, but should not be more than eight years.

Programmes must be underpinned by a sound delivery platform. There must be evidence that the communications systems in place enable interaction between students and their tutors as well as their peers, so that students are not disadvantaged by comparison with campus-based students.

The awarding HEI is responsible for the academic standards of its awards and the quality of provision leading to them. The arrangements for assuring quality and standards should be as rigorous, secure and open to scrutiny as those for programmes provided wholly within the responsibility of a single HEI and through conventional class-based modes of teaching. Particular attention should be paid to the awarding HEI's procedures for approving and reviewing any delivery partner and its agents.

The accreditors must meet with students during the accreditation visit. This may be a face-to-face meeting, or it may use a suitable telecommunications service or application.

Accreditors must assure themselves that robust systems are in place to ensure the authenticity of students, especially where any examinations are taken off campus or outside the UK.

Degree apprenticeships

The QAA document Characteristics Statement - Higher Education in Apprenticeships may be a useful reference for anyone who is not familiar with degree apprenticeships.

Degree apprenticeships and other work-based degree programmes may deliver some, or all, of the competences required for registration and/or may be more suitable for approval than accreditation. For this reason: refer to AAQA as well as AHEP.

Distance Learning

Further information related to accreditation of distance learning programmes is provided in the Guidance Note on Academic Accreditation. This can be found under 'Useful Documents' on the Engineering Council website: www.engc.org.uk/ahep

Initial application

Which Licensee?

Before applying for accreditation, HEIs will first need to decide which Licensee or Licensees it wishes to seek accreditation from. That decision will be largely dictated by the programme's specialism or underlying content. Accreditation may be awarded only by Licensees licensed to do so by the Engineering Council. Information about Licensees is available at: www.engc.org.uk/licensees

Making the application

HEIs must apply directly to the Licensee or Licensees they are seeking accreditation from, unless seeking a joint Engineering Accreditation Board (EAB) visit.. The Licensee will advise on the procedure and the requirements for the sectors and/or disciplines of the engineering profession that they serve. Some Licensees request a brief initial submission covering basic details that is used to determine if the programme is likely to meet its requirements for accreditation.

What happens next?

Once satisfied that the programme is likely to meet its requirements for accreditation, the Licensee will appoint an accreditation panel and make arrangements for the visit. The panel will include academic and industrial members trained in, and familiar with, the principles and requirements of accreditation. There may also be a visit secretariat and there may be observers (eg trainee accreditors). The visit typically takes place over two or three days.

The panel will expect to meet staff and students. Where practical, panels may wish to meet industry representatives involved in programme design and delivery, who may be members of an Industrial Advisory Board (IAB) or equivalent. Meetings may be face-to-face or use a suitable telecommunication technology or platform.

During the visit, the panel will expect to see laboratories and other teaching spaces and be provided with examples of the full range of marked student work including any major projects, along with marking schemes/assessment criteria and written feedback to students. The operation of internal quality assurance systems will

also be reviewed, which in the UK will include external examiner reports.

Location of delivery

Licensees must normally visit all campuses involved in the delivery of programmes they are invited to accredit, or only accredit for delivery in campuses visited. A visit is usually required to enable the Licensee to consider evidence from a range of indicators, including those listed in paragraph 43 of RfR. If a programme is delivered on multiple campuses (including through franchise or partnership[2] arrangements) students will only be considered to have completed an accredited programme if they have completed the programme at a campus[3] for which accreditation is confirmed.

If a degree is delivered at multiple campuses the HEI must either:

- Agree a means of clearly presenting the campus of study/ accreditation status of each degree awarded with the accrediting Licensee(s) (this might be on degree certificates, transcripts or HEI issued certificates of accreditation), or
- Ensure that the degree is accredited for delivery at every campus for the same intake dates.

Any such agreement must be recorded on the Engineering Council database.

HEIs must inform accrediting Licensees if they have:

- Franchised degree programmes and/or
- Degrees delivered through collaborative partnership(s) and/or
- Degrees delivered at different campuses.

HEIs must either:

- Secure accreditation of engineering provision that is delivered through franchise or partnership arrangements and at all campuses, or
- Make it absolutely clear in any material referring to programmes, that such programmes have not been accredited.

Licensees may refuse to accredit programmes if they believe that HEIs are not being sufficiently clear about the non-accredited status of programmes.

Costs

There may be a charge for the process, especially for visits outside the UK. There will inevitably be some costs to the HEI seeking accreditation. Mainly, but not wholly, this cost will be in staff time. Further information is available from the relevant Licensee.

Accreditation by more than one Licensee

When a programme has the potential to be accredited by a number of Licensees, joint accreditation visits are an option that can reduce the administrative burden. Many Licensees will undertake joint visits when requested.

The Engineering Accreditation Board (EAB) acts as a single point of contact to arrange joint visits when accreditation is sought from three or more Licensees, for either mixed discipline degrees or engineering courses with commonality. The Engineering Council provides the Secretariat for EAB.

[2] Partnership in this context refers specifically to partnership arrangements pertaining to the delivery of an accredited degree.

[3] Completed at a campus means that the student registered at that campus and, with the exception of distance or work-based learning students, they completed the majority of their studies including final assessments at that campus.

Further information is available at: www.engc.org.uk/eab

Application for re-accreditation

Re-accreditation is normally undertaken using the same processes as the original accreditation, unless there have been changes in Engineering Council regulations or Licensee processes in the interim.

Decision-making and outcomes

Any Licensee considering a request to accredit a degree programme in a way that is not explicitly covered by AHEP must consult the Engineering Council. This may include topics such as process, the level of the programme (ISCED) and the accreditation to be conferred. If the Licensee wishes to accredit on this basis it must seek prior authorisation from the Engineering Council.

Programmes are normally accredited for up to five years. However, accreditation may be awarded for a shorter period, especially in the case of new programmes where it is necessary to monitor outputs.

Programmes may be accredited as either:

- **fully** meeting the underpinning knowledge and understanding for registration as either IEng or CEng; or
- **partially** meeting the underpinning knowledge and understanding for registration as either IEng or CEng.

It is not correct to use qualifying phrases such as ‘provisional accreditation’ and ‘partial accreditation’.

Once accreditation is awarded

The Licensee(s)

Licensees are responsible for entering details of accredited programmes into the Engineering Council’s publicly accessible recognised course search database.

After publication, programmes accredited by one Licensee may also be recognised by other Licensees when assessing applicants for professional registration.

The HEI

Following accreditation, the HEI must:

- Notify the Licensee of any major changes during the period of accreditation that would either affect the delivery of the specified programme outcomes or change the title of the degree programme.
- Ensure that they provide students and prospective students with accurate information about the accreditation status of their degree programmes and the relationship to IEng or CEng registration. HEIs in the UK should refer to advice on consumer protection law published by the Competition and Markets Authority (CMA).

HEIs are encouraged to use the relevant logo(s) shown on page 20, alongside the name of all degree programmes that are accredited by a Licensee.

The logos may be downloaded at:
www.engc.org.uk/accrediteddegreelogo

English version

Welsh version

The Engineering Council has developed specific wording about accredited engineering degrees, for use by HEIs in print and digital marketing material. For HEIs in the UK this text can be used when submitting their Key Information Set (KIS) and Unistats statements regarding professional body recognition.

HEIs will be provided with a set of statements that name the specific Licensee (such as the Institution of Mechanical Engineers or the Royal Aeronautical Society), that is licensed by the Engineering Council to accredit degrees. In some instances, a degree may be accredited by several Licensees and HEIs will be able to choose the statements that apply to that programme.

These statements are as follows, with **XXX** standing in for the name of the specific Licensee:

Masters other than the Integrated Masters or Doctorate
Accredited by the **XXX** on behalf of the Engineering Council as meeting the requirements for Further Learning for registration as a Chartered Engineer. To hold accredited qualifications for CEng registration, candidates must also hold a CEng accredited Bachelors (Hons) undergraduate degree.

Integrated Masters
Accredited by the **XXX** on behalf of the Engineering Council for the purposes of fully meeting the academic requirement for registration as a Chartered Engineer.

Bachelors (Hons)
Accredited by the **XXX** on behalf of the Engineering Council for the purposes of fully meeting the academic requirement for registration as an Incorporated Engineer and partially meeting the academic requirement for registration as a Chartered Engineer. Candidates must hold a masters or doctorate accredited as further learning for CEng to hold accredited qualifications for CEng registration.

Bachelors (with or without honours)
Accredited by the **XXX** on behalf of the Engineering Council for the purposes of fully meeting the academic requirement for registration as an Incorporated Engineer.

Bachelors top-up degrees (with or without honours)
Accredited by the **XXX** on behalf of the Engineering Council as meeting the requirements for Further Learning for registration as an Incorporated Engineer. To hold accredited qualifications for IEng registration candidates must also hold an accredited Foundation degree or HND.

Foundation Degrees
Accredited by the **XXX** on behalf of the Engineering Council for the purposes of fully meeting the academic requirements for registration as an Engineering Technician and partially meeting the academic requirement for registration as an Incorporated Engineer. Candidates must hold a Bachelors (with or without

honours) accredited as further learning for IEng to hold accredited qualifications for IEng registration.

The Engineering Council website has a page about degree accreditation: www.engc.org.uk/students-apprentices-graduates

Higher Educational Institutions may wish to alert potential students and current students to this page for information about degree accreditation, their future prospects, and information about Licensees for student membership and pathways to professional registration.

The Engineering Council also maintains a publicly accessible recognised course search database including accredited degrees which is available at: www.engc.org.uk/courses

Generic learning outcomes and defining characteristics

Programmes shall only be accredited when they are delivered at the right level and meet all the learning outcomes specified by the accrediting Licensee.

The learning outcomes used during accreditation are derived from the generic learning outcomes for accredited programmes. These are set out on pages 23-25, along with the characteristics that define accredited degree programmes.

Defining characteristics of approved and accredited programmes

The defining characteristics presented in AHEP are common to those presented in AAQA for IEng and CEng recognition.

Foundation degrees and equivalent qualifications accredited as partially meeting the educational requirement for IEng registration (further learning to Bachelors level will be required)

ISCED: **Level 5**
EQF: **Level 5**

Foundation degrees or equivalent qualifications accredited for the purpose of IEng registration will have an emphasis on the applications of current and developing technology.

An individual who has completed a Foundation degree or equivalent qualification must achieve the prescribed learning outcomes and will possess a coherent body of knowledge including mathematics, natural science and engineering principles, and a proven ability to apply that knowledge to analyse and solve broadly-defined problems using established principles and techniques.

With an appreciation of professional engineering practice and ethics, graduates will be able to apply their knowledge and skills to new situations.

Bachelors degrees and Bachelors (Honours) degrees accredited for IEng registration (including Top-up degrees)

ISCED: **Level 6**
EQF: **Level 6**

Bachelors degrees and Bachelors (Honours) degrees accredited for the purpose of IEng registration will have an emphasis on the applications of current and developing technology.

Graduates from a Bachelors degree or Bachelors (Honours) degree must achieve the prescribed learning outcomes and will possess a coherent body of knowledge including mathematics, natural science and engineering principles, and a proven ability to apply that knowledge to analyse and solve broadly-defined problems using established principles and techniques. Some of the knowledge will be informed by current developments in the subject of study.

With an appreciation of professional engineering practice and ethics, graduates will be commercially aware and able to apply their knowledge and skills to design and deliver products, systems and processes to meet defined needs using current technology.

Bachelors (Honours) degrees accredited as partially meeting the educational requirement for CEng registration (further learning to Masters level will be required)

ISCED: **Level 6**
EQF: **Level 6**

Bachelors (Honours) degrees accredited for the purpose of CEng registration will have an emphasis on developing solutions to engineering problems using new or existing technologies, through innovation, creativity and change.

Graduates from a Bachelors (Honours) degree must achieve the prescribed learning outcomes and will possess a coherent body of knowledge including mathematics, natural science and engineering principles, and a proven ability to apply that knowledge to analyse and solve complex problems. Some of the knowledge will be at the forefront of the particular subject of study.

Graduates will be able to select and apply quantitative and computational analysis techniques, recognising the limitations of the methods employed.

With an appreciation of professional engineering practice and ethics, graduates will be commercially aware and able to apply their knowledge and skills to design and deliver new products or services to meet defined needs using new or existing technologies.

Masters degrees other than the Integrated Masters (MEng) (accredited as further learning to Masters level, partially meeting the educational requirement for CEng)

ISCED: **Level 7**
EQF: **Level 7**

Masters degrees, other than the Integrated Masters accredited as further learning to Masters level for the purposes of CEng registration, vary in nature. Some offer the chance to study, in greater depth, particular aspects or applications of a broader discipline in which the graduate holds an Honours degree at Bachelors level. Others bring together different engineering disciplines or subdisciplines in the study of a particular topic, or engineering application. These programmes should provide a foundation for leadership and innovative engineering practice.

Graduates from a Masters degree other than the Integrated Masters must achieve the prescribed learning outcomes and will possess a coherent body of knowledge including mathematics, natural science and engineering principles, and a proven ability to apply that knowledge to analyse and solve complex problems. Much of the knowledge will be at the forefront of the particular subject of study.

Graduates will be able to select and apply quantitative and computational analysis techniques in the absence of complete data, discussing the limitations of the methods employed.

With an appreciation of professional engineering practice and ethics, graduates will be commercially aware and able to apply their knowledge and skills to design, deliver and evaluate innovative new products or services to meet defined needs, using new or existing technologies.

Integrated Masters (MEng) degrees accredited for CEng registration

ISCED: **Level 7**
EQF: **Level 7**

Integrated Masters degrees (often denoted MEng) accredited for the purpose of CEng registration will have an emphasis on developing solutions to problems, using new or existing technologies, through innovation, creativity and change.

The Integrated Masters will go beyond the outcomes of accredited Bachelors (Honours) degrees to provide a greater range and depth of specialist knowledge, within an authentic environment, as well as a broader and more general academic base. These programmes should provide a foundation for leadership and innovative engineering practice.

Graduates from an Integrated Masters degree must achieve the prescribed learning outcomes and will possess a broad and coherent body of knowledge including mathematics, natural science and engineering principles, and a proven ability to apply that knowledge to analyse and solve complex problems. Much of the knowledge will be at the forefront of the particular subject of study.

Graduates will be able to select and apply quantitative and computational analysis techniques in the absence of complete data, discussing the limitations of the methods employed.

With an appreciation of professional engineering practice and ethics, graduates will be commercially aware and able to apply their knowledge and skills to design, deliver and evaluate innovative new products or services to meet defined needs using new or existing technologies.

Notes on learning outcomes

The table below presents the learning outcomes for AHEP 4 and AAQA; a version of this with the addition of a note to indicate the level at which each learning outcome must be demonstrated can be downloaded in an A3 table from the Engineering Council website: www.engc.org.uk/ahep. Note that when consideration is given to accreditation of programmes of further learning no consideration is needed of any 'learning outcome achieved at previous level of study' as accreditation will only apply for individuals who have completed a suitably accredited programme for which the programme serves as further learning.

1. The learning outcomes presented in AHEP are common to those presented in AAQA for IEng and CEng recognition.
2. **Broadly-defined problems** involve a variety of factors which may impose conflicting constraints, but can be solved by the application of engineering science and well-proven analysis techniques.
3. **Complex problems** have no obvious solution and may involve wide-ranging or conflicting technical issues and/or user needs that can be addressed through creativity and the resourceful application of engineering science.
4. These learning outcomes are minimum threshold standards and should be interpreted in the context of a particular disciplinary or multidisciplinary engineering practice, and the level of study.
5. An individual who has completed an approved or accredited programme must meet all of the identified learning outcomes, however student learning hours are likely to vary between the five key areas of learning set out on page 10.
6. It is recognised that an approved or accredited programme may develop learning outcome(s) beyond the threshold level, including where learning outcomes are met at the previous level of study, however such additional learning is not prescribed or required for academic accreditation.
7. The learning outcome level required to meet the required programme outcome/registration level is not necessarily that which corresponds with the final year/stage of the programme. Rather, it provides one indication of the earliest programme stage at which the required programme outcome could be met. (As extreme examples, Security (T10-M10) and Lifelong Learning (T18-M18) are defined identically for all registration levels, which implies that they could in principle be met in the first year of an undergraduate programme. These are however AHEP 4 minimum threshold standards, and HEIs may feel that the integrity of their academic programmes would require a more sophisticated approach to security or lifelong learning to be adopted for an MEng than for an EngTech or BEng programme.)
8. The learning outcomes in this document may be a useful reference point when assessing the knowledge and understanding of an individual who does not hold an accredited degree (for example those individuals following sector specific apprenticeships, in-company training programmes, IPD Schemes, etc.).
9. The Engineering Council defines security as 'the state of relative freedom from threat or harm caused by deliberate, unwanted, hostile or malicious acts. It operates on a number of levels ranging from national security issues to countering crime'. See the guidance note at: www.engc.org.uk/security

Area of learning	Incorporated Engineer		
	Foundation degrees, Higher National Diplomas and equivalent qualifications and apprenticeships approved or accredited as fully meeting the academic requirement for EngTech registration and partially meeting the academic requirement for IEng registration (Partial IEng)	**Bachelors Top-up degrees and equivalent qualifications and apprenticeships approved or accredited as meeting the requirement for further learning for IEng registration (IEng Further Learning)**	**Bachelors degrees and Bachelors (Honours) and equivalent qualifications and apprenticeships approved or accredited as fully meeting the academic requirement for IEng registration (IEng)**
On successful completion of an approved or accredited programme, an individual will be able to:			
Science and mathematics The study of engineering requires a substantial grounding in engineering principles, science and mathematics commensurate with the level of study.			
Science, mathematics and engineering principles	**F1.** Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems.	**B1.** Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.	**B1.** Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.

Area of Learning	Incorporated Engineer (continued)		
	Foundation degrees, Higher National Diplomas and equivalents (continued)	Bachelors Top-up degrees and equivalents (continued)	Bachelors degrees and Bachelors (Honours) and equivalents (continued)
On successful completion of an approved or accredited programme, an individual will be able to:			
Engineering analysis Engineering analysis involves the application of engineering concepts and tools to analyse, model and solve problems. At higher levels of study engineers will work with information that may be uncertain or incomplete.			
Problem analysis	**F2.** Analyse broadly-defined problems reaching substantiated conclusions.	**B2.** Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.	**B2.** Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.
Analytical tools and techniques	**F3.** Use appropriate computational and analytical techniques to model broadly-defined problems.	**B3.** Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed.	**B3.** Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed.
Technical literature	**F4.** Select and use technical literature and other sources of information to address broadly-defined problems.	**B4.** Select and evaluate technical literature and other sources of information to address broadly-defined problems.	**B4.** Select and evaluate technical literature and other sources of information to address broadly-defined problems.

Area of learning	Incorporated Engineer (continued)		
	Foundation degrees, Higher National Diplomas and equivalents (continued)	Bachelors Top-up degrees and equivalents (continued)	Bachelors degrees and Bachelors (Honours) and equivalents (continued)
On successful completion of an approved or accredited programme, an individual will be able to:			
Design and innovation Design is the creation and development of an economically viable product, process or system to meet a defined need. It involves significant technical and intellectual challenges commensurate with the level of study.			
Design	**F5.** Design solutions for broadly-defined problems that meet a combination of user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal and environmental matters, codes of practice and industry standards.	**B5.** Design solutions for broadly-defined problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.	**B5.** Design solutions for broadly-defined problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.
Integrated/systems approach	**F6.** Apply a systematic approach to the solution of broadly-defined problems.	**B6.** Apply an integrated or systems approach to the solution of broadly-defined problems.	**B6.** Apply an integrated or systems approach to the solution of broadly-defined problems.

Area of learning	Incorporated Engineer (continued)		
	Foundation degrees, Higher National Diplomas and equivalents (continued)	Bachelors Top-up degrees and equivalents (continued)	Bachelors degrees and Bachelors (Honours) and equivalents (continued)
On successful completion of an approved or accredited programme, an individual will be able to:			
The engineer and society Engineering activity can have a significant societal impact and engineers must operate in a responsible and ethical manner, recognise the importance of diversity, and help ensure that the benefits of innovation and progress are shared equitably and do not compromise the natural environment or deplete natural resources to the detriment of future generations.			
Sustainability	**F7.** Evaluate the environmental and societal impact of solutions to broadly-defined problems.	Learning outcome achieved at previous level of study.	**B7.** Evaluate the environmental and societal impact of solutions to broadly-defined problems.
Ethics	**F8.** Identify ethical concerns and make reasoned ethical choices informed by professional codes of conduct.	**B8.** Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.	**B8.** Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.
Risk	**F9.** Identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.	**B9.** Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.	**B9.** Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.
Security	**F10.** Adopt a holistic and proportionate approach to the mitigation of security risks.	Learning outcome achieved at previous level of study.	**B10.** Adopt a holistic and proportionate approach to the mitigation of security risks.
Equality, diversity and inclusion	**F11.** Recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.	Learning outcome achieved at previous level of study.	**B11.** Recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.

Area of learning	Incorporated Engineer (continued)		
	Foundation degrees, Higher National Diplomas and equivalents (continued)	**Bachelors Top-up degrees and equivalents (continued)**	**Bachelors degrees and Bachelors (Honours) and equivalents (continued)**
On successful completion of an approved or accredited programme, an individual will be able to:			
Engineering practice The practical application of engineering concepts and tools, engineering and project management, teamwork and communication skills. Engineers also require a sound grasp of the commercial context of their work, specifically the ways an organisation creates, delivers and captures value in economic, social, cultural or other contexts.			
Practical and workshop skills	**F12.** Use practical laboratory and workshop skills to investigate broadly-defined problems.	Learning outcome achieved at previous level of study.	**B12.** Use practical laboratory and workshop skills to investigate broadly-defined problems.
Materials, equipment, technologies and processes	**F13.** Select and apply appropriate materials, equipment, engineering technologies and processes.	Learning outcome achieved at previous level of study.	**B13.** Select and apply appropriate materials, equipment, engineering technologies and processes.
Quality management	**F14.** Recognise the need for quality management systems and continuous improvement in the context of broadly-defined problems.	Learning outcome achieved at previous level of study.	**B14.** Recognise the need for quality management systems and continuous improvement in the context of broadly-defined problems.
Engineering and project management	**F15.** Apply knowledge of engineering management principles, commercial context and project management.	**B15.** Apply knowledge of engineering management principles, commercial context, project management and relevant legal matters.	**B15.** Apply knowledge of engineering management principles, commercial context, project management and relevant legal matters.
Teamwork	**F16.** Function effectively as an individual, and as a member or leader of a team.	Learning outcome achieved at previous level of study.	**B16.** Function effectively as an individual, and as a member or leader of a team.
Communication	**F17.** Communicate effectively with technical and non-technical audiences.	Learning outcome achieved at previous level of study.	**B17.** Communicate effectively with technical and non-technical audiences.
Lifelong learning	**F18.** Plan and record self-learning and development as the foundation for lifelong learning/CPD.	Learning outcome achieved at previous level of study.	**B18.** Plan and record self-learning and development as the foundation for lifelong learning/CPD.

Area of learning	Chartered Engineer		
	Bachelors (Honours) degrees and equivalent qualifications and apprenticeships approved or accredited as fully meeting the academic requirement for IEng registration and partially meeting the academic requirement for CEng registration (Partial CEng)	**Masters degrees other than the Integrated Masters and Doctoral programmes and equivalent qualifications and apprenticeships approved or accredited as meeting the requirement for further learning for CEng registration (CEng Further Learning)**	**Integrated Masters degrees and equivalent qualifications and apprenticeships approved or accredited as fully meeting the academic requirement for CEng registration (CEng)**
On successful completion of an approved or accredited programme, an individual will be able to:			
Science and mathematics The study of engineering requires a substantial grounding in engineering principles, science and mathematics commensurate with the level of study.			
Science, mathematics and engineering principles	**C1.** Apply knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Some of the knowledge will be at the forefront of the particular subject of study.	**M1.** Apply a comprehensive knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Much of the knowledge will be at the forefront of the particular subject of study and informed by a critical awareness of new developments and the wider context of engineering.	**M1.** Apply a comprehensive knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Much of the knowledge will be at the forefront of the particular subject of study and informed by a critical awareness of new developments and the wider context of engineering.

Area of learning	Chartered Engineer (continued)		
	Bachelors (Honours) degrees and equivalents (continued)	**Masters degrees other than the Integrated Masters and Doctoral programmes and equivalents (continued)**	**Integrated Masters degrees and equivalents (continued)**
On successful completion of an approved or accredited programme, an individual will be able to:			
Engineering analysis Engineering analysis involves the application of engineering concepts and tools to analyse, model and solve problems. At higher levels of study engineers will work with information that may be uncertain or incomplete.			
Problem analysis	**C2.** Analyse complex problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.	**M2.** Formulate and analyse complex problems to reach substantiated conclusions. This will involve evaluating available data using first principles of mathematics, statistics, natural science and engineering principles, and using engineering judgment to work with information that may be uncertain or incomplete, discussing the limitations of the techniques employed.	**M2.** Formulate and analyse complex problems to reach substantiated conclusions. This will involve evaluating available data using first principles of mathematics, statistics, natural science and engineering principles, and using engineering judgment to work with information that may be uncertain or incomplete, discussing the limitations of the techniques employed.
Analytical tools and techniques	**C3.** Select and apply appropriate computational and analytical techniques to model complex problems, recognising the limitations of the techniques employed.	**M3.** Select and apply appropriate computational and analytical techniques to model complex problems, discussing the limitations of the techniques employed.	**M3.** Select and apply appropriate computational and analytical techniques to model complex problems, discussing the limitations of the techniques employed.
Technical literature	**C4.** Select and evaluate technical literature and other sources of information to address complex problems.	**M4.** Select and critically evaluate technical literature and other sources of information to solve complex problems.	**M4.** Select and critically evaluate technical literature and other sources of information to solve complex problems.

Area of learning	Chartered Engineer (continued)		
	Bachelors (Honours) degrees and equivalents (continued)	Masters degrees other than the Integrated Masters and Doctoral programmes and equivalents (continued)	Integrated Masters degrees and equivalents (continued)
On successful completion of an approved or accredited programme, an individual will be able to:			
Design and innovation Design is the creation and development of an economically viable product, process or system to meet a defined need. It involves significant technical and intellectual challenges commensurate with the level of study.			
Design	**C5.** Design solutions for complex problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.	**M5.** Design solutions for complex problems that evidence some originality and meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.	**M5.** Design solutions for complex problems that evidence some originality and meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.
Integrated/systems approach	**C6.** Apply an integrated or systems approach to the solution of complex problems.	Learning outcome achieved at previous level of study.	**M6.** Apply an integrated or systems approach to the solution of complex problems.

Area of learning	Chartered Engineer (continued)		
	Bachelors (Honours) degrees and equivalents (continued)	Masters degrees other than the Integrated Masters and Doctoral programmes and equivalents (continued)	Integrated Masters degrees and equivalents (continued)
On successful completion of an approved or accredited programme, an individual will be able to:			
The engineer and society Engineering activity can have a significant societal impact and engineers must operate in a responsible and ethical manner, recognise the importance of diversity, and help ensure that the benefits of innovation and progress are shared equitably and do not compromise the natural environment or deplete natural resources to the detriment of future generations.			
Sustainability	**C7.** Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts.	**M7.** Evaluate the environmental and societal impact of solutions to complex problems (to include the entire life-cycle of a product or process) and minimise adverse impacts.	**M7.** Evaluate the environmental and societal impact of solutions to complex problems (to include the entire life-cycle of a product or process) and minimise adverse impacts.
Ethics	**C8.** Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.	Learning outcome achieved at previous level of study.	**M8.** Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.
Risk	**C9.** Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.	Learning outcome achieved at previous level of study.	**M9.** Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.
Security	**C10.** Adopt a holistic and proportionate approach to the mitigation of security risks.	Learning outcome achieved at previous level of study.	**M10.** Adopt a holistic and proportionate approach to the mitigation of security risks.
Equality, diversity and inclusion	**C11.** Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.	Learning outcome achieved at previous level of study.	**M11.** Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.

Area of learning	Chartered Engineer (continued)		
	Bachelors (Honours) degrees and equivalents (continued)	Masters degrees other than the Integrated Masters and Doctoral programmes and equivalents (continued)	Integrated Masters degrees and equivalents (continued)
On successful completion of an approved or accredited programme, an individual will be able to:			
Engineering practice The practical application of engineering concepts and tools, engineering and project management, teamwork and communication skills. Engineers also require a sound grasp of the commercial context of their work, specifically the ways an organisation creates, delivers and captures value in economic, social, cultural or other contexts.			
Practical and workshop skills	**C12.** Use practical laboratory and workshop skills to investigate complex problems.	Learning outcome achieved at previous level of study.	**M12.** Use practical laboratory and workshop skills to investigate complex problems.
Materials, equipment, technologies and processes	**C13.** Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations.	Learning outcome achieved at previous level of study.	**M13.** Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations.
Quality management	**C14.** Discuss the role of quality management systems and continuous improvement in the context of complex problems.	Learning outcome achieved at previous level of study.	**M14.** Discuss the role of quality management systems and continuous improvement in the context of complex problems.
Engineering and project management	**C15.** Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.	Learning outcome achieved at previous level of study.	**M15.** Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.
Teamwork	**C16.** Function effectively as an individual, and as a member or leader of a team.	**M16.** Function effectively as an individual, and as a member or leader of a team. Evaluate effectiveness of own and team performance.	**M16.** Function effectively as an individual, and as a member or leader of a team. Evaluate effectiveness of own and team performance.

Area of learning	Chartered Engineer (continued)		
	Bachelors (Honours) degrees and equivalents (continued)	**Masters degrees other than the Integrated Masters and Doctoral programmes and equivalents (continued)**	**Integrated Masters degrees and equivalents (continued)**
On successful completion of an approved or accredited programme, an individual will be able to:			
Engineering practice (continued)			
Communication	**C17.** Communicate effectively on complex engineering matters with technical and non-technical audiences.	**M17.** Communicate effectively on complex engineering matters with technical and non-technical audiences, evaluating the effectiveness of the methods used.	**M17.** Communicate effectively on complex engineering matters with technical and non-technical audiences, evaluating the effectiveness of the methods used.
Lifelong learning	**C18.** Plan and record self-learning and development as the foundation for lifelong learning/CPD.	Learning outcome achieved at previous level of study.	**M18.** Plan and record self-learning and development as the foundation for lifelong learning/CPD.

The learning outcomes can also be downloaded in an A3 table from the Engineering Council website: www.engc.org.uk/ahep

International recognition

The Engineering Council is a signatory to the following international accords:

- The EUR-ACE® Accord (EUR-ACE®)
- The Washington Accord (WA)
- The Sydney Accord (SA)
- The Dublin Accord (DA)

The EUR-ACE®, Washington and Sydney Accords provide a mechanism for mutual recognition, by signatory countries, of accredited degrees. The Dublin Accord supports mutual recognition of accredited or approved qualifications and programmes.

The Washington, Sydney and Dublin Accords apply to accreditation or approval by a signatory of programmes delivered by educational institutions within the national or territorial jurisdiction of that signatory. In the case of the Engineering Council, this recognition applies to programmes accredited or approved for providers in England, Scotland, Wales and Northern Ireland only.

The EUR-ACE® Accord

The EUR-ACE® Accord, administered by the ENAEE, demonstrates the international standing of accredited degrees. Programmes that carry the EUR-ACE® label are recognised within the Qualifications Framework of the European Higher Education Area (QF-EHEA). Award of the EUR-ACE® label shows that a programme is recognised by ENAEE as a first cycle degree (Bachelors degrees delivering the equivalent of at least 180 ECTS credits) or second cycle degree (Integrated Masters (MEng), MSc, etc).

For further details see: www.engc.org.uk/eurace

The Washington Accord

The Washington Accord was first signed in 1989. It recognises that professional engineering education programmes accredited by the signatories deliver outcomes that meet, or exceed, the Washington Accord Graduate Attributes (learning outcomes). Degrees accredited under the Engineering Council licence as meeting the educational base for CEng are recognised by the Washington Accord.

For further details see: www.ieagreements.org/washington

The Sydney Accord

The Sydney Accord was first signed in 2001. It recognises that engineering technologist education programmes accredited by the signatories deliver outcomes that meet, or exceed, the Sydney Accord Graduate Attributes (learning outcomes). Degrees accredited under the Engineering Council licence as meeting the educational base for IEng are recognised by the Sydney Accord.

For further details see: www.ieagreements.org/sydney

The Dublin Accord

The Dublin Accord was first signed in 2002. It recognises that the educational base for Engineering Technicians (EngTechs) approved or accredited by the signatories deliver outcomes that

meet, or exceed, the Dublin Accord Graduate Attributes (learning outcomes). Programmes approved under the Engineering Council licence as meeting the educational base for EngTech are recognised by the Dublin Accord.

For further details see: www.ieagreements.org/dublin

Note: international recognition only applies to programmes (or combinations of programmes) that are accredited or approved against all the learning outcomes for a relevant professional registration title.

For further detail about international recognition, including links to lists of current signatories of the mutual recognition agreements, see: www.engc.org.uk/international

Glossary

AAQA	**Approval and Accreditation of Qualifications and Apprenticeships**. This document is one of the Standards which the **Engineering Council** publishes, along with **AHEP**, the **ICT*Tech* Standard**, **RfR** and **UK-SPEC**. AAQA sets out the standards and **learning outcomes** which must be met for qualifications and apprenticeships to be approved for **registration** at all levels, ie. **EngTech** or **ICT*Tech***, **IEng** and **CEng**. Previously known as AQAH (Approval of Qualifications and Apprenticeships Handbook). See: www.engc.org.uk/aaqa
Accreditation	A process of peer review of a degree **programme** against published **learning outcomes**. This usually involves a visit from a team of professional engineers nominated by **Licensees** to the degree awarding body.
Chartered Engineer (CEng)	One of the professional registration titles available to individuals who meet the required standards of **competence** and **commitment**. See: www.engc.org.uk/ceng
Compensation	The practice of allowing marginal failure (ie not more than 10% below the nominal pass mark) of one or more modules and awarding credit for them on the basis of good overall academic performance. See page 15.
Competence	The ability to carry out appropriate tasks to an effective standard. Achieving competence requires the right level of knowledge, understanding and skill, as well as a professional attitude. Demonstrating both competence and **commitment** is part of the requirement to become professionally registered with the **Engineering Council**.
Competition and Markets Authority (CMA)	The CMA works to promote competition for the benefit of consumers, both within and outside the UK. It is an independent non-ministerial government department.
Condonement	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. See page 15.

Delivery	The delivery of a **programme**, encompassing teaching, resources and facilities, methods of learning, development and assessment, support and supervision. Not to be confused with the design of a programme, which encompasses the planning, content or syllabus.
Dublin Accord	An international agreement among the bodies responsible for recognising programmes and qualifications for **Engineering Technicians**. It establishes a benchmark for Engineering Technician education across those bodies, and recognises the equivalence of **accredited** or approved Engineering Technician programmes. See International recognition on page 38 or: www.ieagreements.org/dublin
EAB	**Engineering Accreditation Board**. www.engc.org.uk/eab
ECTS	**European Credit Transfer and Accumulation System**. A tool of the European Higher Education Area (EHEA) for making studies and courses more transparent. Based on the courses' defined learning outcomes and associated workloads.
ENAEE	**European Network for Engineering Accreditation**. ENAEE is the European network which authorises **accreditation** and quality assurance agencies to award the **EUR-ACE®** label to accredited engineering degree **programmes**. See: www.enaee.eu
Engineering Council	The UK regulatory body for the engineering profession. The Engineering Council sets and maintains internationally recognised standards of professional **competence** and ethics and holds the UK register of professional engineers and technicians. www.engc.org.uk
Engineering Technician (EngTech)	One of the professional registration titles available to individuals who meet the required standards of **competence** and **commitment**. See: www.engc.org.uk/engtech
EUR-ACE®	**EUR-ACE® (EURopean-ACcredited Engineer)** is a quality assurance label that can be awarded to **accredited** engineering degree **programmes**. The **Engineering Council** is authorised by **ENAEE** to award the EUR-ACE® label.
Graduate Attributes	A set of statements on the expected capability of graduates from an **accredited programme**.

HEI	**Higher Education Institution**. Any institution that provides **higher education programmes**. Most UK higher education courses are taught by universities, but many are also taught at colleges and other specialist institutions. Some 'private providers' are entering the market, and the term 'higher education provider' is now also used.
Higher Education	In the UK this refers to education that is post-school. In England and Northern Ireland this is defined in the Regulated Qualifications Framework (RQF) as being at a level between 4 and 8. In Wales this is defined in the Credit and Qualifications Framework (CQFW) as being at a level between 4 and 8. The Scottish Credit and Qualifications Framework places higher education at a level between 7 and 12. It includes: Certificate of Higher Education, Diploma of Higher Education, Bachelors degrees, Masters degrees, and Doctoral degrees.

IAB	**Industrial Advisory Board**. Group of industrialists who advise an **HEI**'s department on matters such as curriculum design and **delivery**, often they also support delivery for example by providing lectures, site visits, projects etc. Some departments use alternative terminology such as Industrial Liaison Committee (ILC).
IEA	International Engineering Alliance. A partnership of international organisations that are signatories to certain international engineering education accords, currently the **Dublin**, **Sydney** and **Washington Accords**. See: www.ieagreements.org
Incorporated Engineer (IEng)	One of the professional registration titles available to individuals who meet the required standards of **competence** and **commitment**. See: www.engc.org.uk/ieng
ISCED	The UNESCO **International Standard for Classification of Education** is designed to serve as a framework to classify educational activities, as defined in **programmes,** and the resulting qualifications into internationally agreed categories.

Learning outcomes	Learning outcomes describe the measurable skills, abilities, knowledge or values that students should be able to demonstrate as a result of completing a **programme** of study. They are student-centred rather than teacher-centred, in that they describe what the students will do, not what the instructor will teach.
Licensee	An engineering membership organisation which is licensed by the **Engineering Council** to assess applicants for **professional registration**. Some Licensees are also licensed to approve or **accredit programmes** of learning. Licensees are sometimes known informally as Professional Engineering Institutions or PEIs. For a full and current list of Licensees see: www.engc.org.uk/licensees
Module	A self-contained, formally structured learning experience with a coherent and explicit set of **learning outcomes** and assessment criteria – normally with an allocated credit rating and level of study.

Professional registration	The process in which an individual is admitted to the Engineering Council's Register as an **Engineering Technician (EngTech)**, **Incorporated Engineer (IEng)**, **Chartered Engineer (CEng)** or an Information and Communications Technology Technician (ICT*Tech*). To achieve professional registration the individual must demonstrate, via a peer review process by a Licensee, that they have met the profession's standards of **commitment** and **competence**. Individuals who have been awarded a professional registration title may use the relevant post-nominal.
Programme	In the context of AHEP, 'programme' means a programme of study leading to a degree award from a **higher education** awarding body (ie an institution with the legal powers to award degrees).
QAA	**Quality Assurance Agency for Higher Education**. QAA is an independent body which checks on standards and quality in UK **higher education**, wherever it is delivered around the world. QAA reviews and develops guidance and reference points for providers and works closely with the **Engineering Council** and **Licensees** to support the engineering disciplines. See: www.qaa.ac.uk

Registration	See **Professional registration**.
RfR	**Regulations for Registration**. One of the Standards which the **Engineering Council** publishes, along with **AAQA**, **AHEP**, **ICT*Tech* Standard** and **UK-SPEC**. RfR sets out the rules, for **Licensees**, on the process of awarding **professional registration** titles such as **ICT*Tech***, **EngTech**, **IEng** or **CEng**.
Sydney Accord	An international agreement among the bodies responsible for **accrediting** engineering technologist degree (**IEng**) **programmes**. It establishes a benchmark for engineering technologist education across those bodies and recognises the equivalence of accredited engineering technologist programmes. See International recognition on page 38 or: www.ieagreements.org/sydney

UK-SPEC	**The UK Standard for Professional Engineering Competence and Commitment**. The UK standard which sets out the **competence** and **commitment** requirements for **registration** with the **Engineering Council** as an **Engineering Technician**, **Incorporated Engineer** or **Chartered Engineer**. www.engc.org.uk/ukspec UK-SPEC is one of the Standards which the **Engineering Council** publishes, along with **AAQA**, **AHEP**, the **ICT*Tech* Standard** and **RfR**.
Washington Accord	An international agreement among the bodies responsible for **accrediting** engineering degree **programmes**. It establishes a benchmark for professional engineering education across those bodies and recognises the equivalence of accredited engineering programmes. See International recognition on page 38 or www.ieagreements.org/washington

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