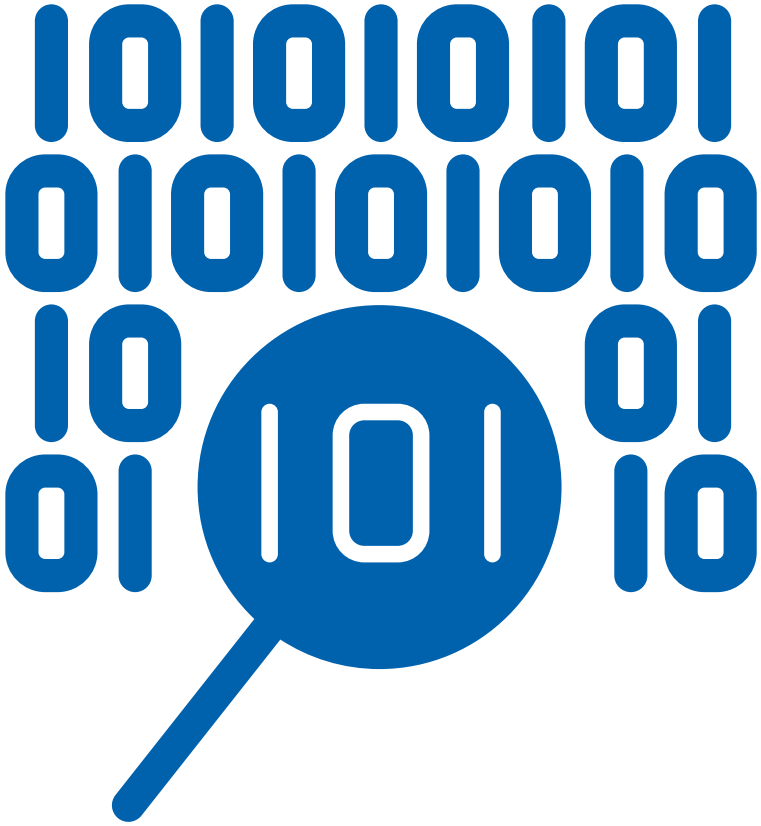
Engineering Council

The Information and Communications Technology Technician (ICT*Tech*) Standard



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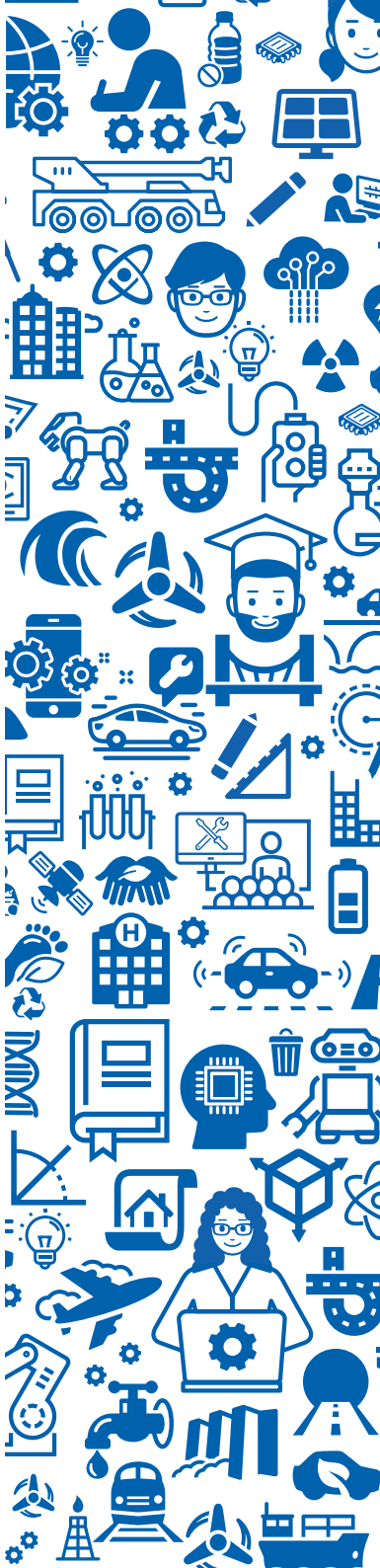


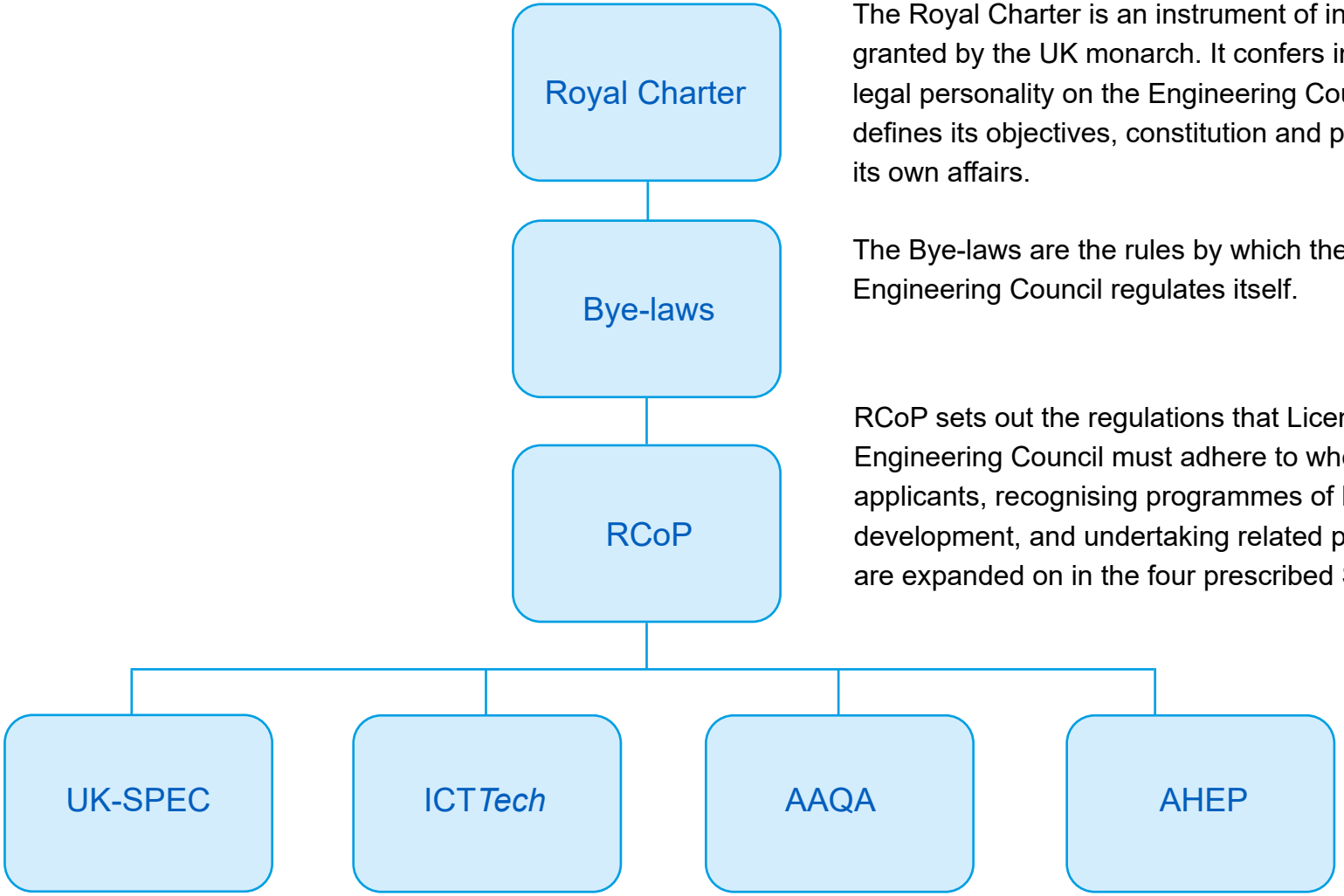
Hierarchy of regulations and prescribed standards

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:

- **The Registration Code of Practice (RCoP)**
- **The UK Standard for Professional Engineering Competence and Commitment (UK-SPEC)**
- **The Information and Communications Technology Technician Standard (ICT*Tech* Standard)**
- **The Approval and Accreditation of Qualifications and Apprenticeships (AAQA)**
- **The 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 shown on the next page.



The Royal Charter is an instrument of incorporation granted by the UK monarch. It confers independent legal personality on the Engineering Council and defines its objectives, constitution and powers to govern its own affairs.

The Bye-laws are the rules by which the Engineering Council regulates itself.

RCoP sets out the regulations that Licensees of the Engineering Council must adhere to when registering applicants, recognising programmes of learning and development, and undertaking related processes. These are expanded on in the four prescribed Standards below.

UK-SPEC and ICT*Tech* Standard are prescribed Standards that, with reference to RCoP, set out the competence and commitment required for registration as CEng, IEng, EngTech and ICT*Tech*.

AAQA and AHEP are prescribed Standards that, with reference to RCoP, set out the policy, context, rules and procedures for recognising learning and development programmes that help develop the competence and commitment set out in UK-SPEC and ICT*Tech* Standard.

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

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Foreword

Engineers and technicians respond to the needs of both society and business, solving complex challenges. Engineers and technicians work in the art and practice of changing our world, enhancing welfare, health and safety while 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.

The knowledge economy of the 21st century is underpinned by the skill, capability and professionalism of Information and Communications Technology (ICT) technicians. In our increasingly mobile, data-driven and interconnected world, we need competent ICT technicians to help design, develop, install and operate both ICT customer solutions and the vital infrastructures that ICT services and products are built upon.

Information and Communications Technology Technicians work in environments ranging from development labs to manufacturing, data centres to customer premises. They support a range of functions using ICT solutions, hardware and software components. These can include, but are not limited to: design, development, implementation, installation, operation, problem solving and security of ICT applications, products, services and/or infrastructures.

Welcome

The purpose of the ICT*Tech* Standard

This document is the Information and Communications Technology Technician Standard (the ICT*Tech* Standard). The primary purpose of the ICT*Tech* Standard is to explain the requirements that individuals must meet and demonstrate in order to achieve professional registration as an Information and Communications Technology Technician (ICT*Tech*). Individuals who have achieved this professional registration title are entitled to use the post-nominal ICT*Tech* after their name.

This document forms part of the Standard used by the UK engineering profession to assess the competence and commitment of individual engineers and technicians. Working closely with major employers of ICT technicians, licensees and ICT technicians themselves, the Engineering Council produced this ICT Technician Standard (the ICT*Tech* Standard) to meet the demand for professional registration of competent technicians in this vital field.

Under its Royal Charter, the Engineering Council licenses professional engineering institutions (Licensees) to assess candidates for professional registration. Professional registration with the Engineering Council is based on an individual's demonstration of competence and commitment.

This document describes the competence and commitment requirements a person must meet to achieve professional registration as an ICT*Tech*. It includes examples of activities that could demonstrate achievement of the requirements. This enables individuals and employers to find out whether they or their staff can meet the requirements.

Qualifications that exemplify the required knowledge and understanding are listed, however it should be noted that there are other ways of demonstrating achievement.

This document also explains:

- Why professional registration is important
- How to achieve professional registration
- What engineers and technicians must do to maintain professional registration, including:
  - the requirement to maintain and enhance competence
  - the obligation to act with integrity and in the public interest
  - membership of a Licensee

Who the ICT*Tech* Standard is for

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

- Individuals who are thinking about becoming professionally registered
- Licensees and Professional Affiliates through which engineers and technicians become registered
- Employers of engineers and technicians
- People responsible for ICT technicians' education or training

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 also be licensed to approve or accredit programmes of learning to specific standards. Licensees are sometimes known informally as Professional Engineering Institutions, or PEIs.

Glossary

At the end of the ICT*Tech* Standard 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.

What is professional registration?

Professional registration verifies that an individual can meet the engineering and technological needs of today, while also anticipating the needs of, and impact on, future generations. Both in the UK and overseas, professional registration gives employers, government and society confidence in the engineering industry. In this way, professional registration offers safeguarding assurances.

Registration demonstrates that an engineer or technician has reached a set standard of knowledge, understanding and occupational competence. It also demonstrates an individual's commitment to professional standards and to developing and enhancing their practice through Continuing Professional Development (CPD).

Registered ICT Technicians have earned the right to put the post-nominal ICT*Tech* after their name and are justifiably proud of that achievement.

Information and Communications Technology is a rapidly growing, dynamic and global field with many new, exciting areas to develop competence in and take more senior responsibilities in. Registered ICT Technicians possess a solid development foundation which acts as a launch pad for career development.

People who gain further qualifications or experience over the course of their careers can be assessed for another professional registration title. Some people continue to develop their competence enabling them to move from ICT*Tech* to other registration categories such as:

- Incorporated Engineer (IEng) www.engc.org.uk/ieng
- Chartered Engineer (CEng) www.engc.org.uk/ceng

Licensees can advise their members on progression opportunities including the requirements for other registration titles.

Why register?

Benefits for individuals: recognition, career development, earning potential

Achieving professional registration sets individual ICT technicians apart from those who are not registered. Gaining a professional title establishes a person's proven knowledge, understanding and competence to a set standard and demonstrates their commitment to developing and enhancing competence.

In our fast-moving world of new technologies and qualifications, professional registration demonstrates a person's commitment to professional standards, and to developing and enhancing competence, as well as a desire to make a contribution to the ICT industry and society.

Maintaining registration as an ICT*Tech* requires continued membership of a Licensee. Licensees, in turn, can help registrants find development opportunities through exposure to new developments, training or opportunities. Benefits of membership may include regular publications, careers advice, access to professional development systems, and opportunities to network with colleagues with similar professional interests.

Progression opportunities

Achievement of ICT*Tech* registration can demonstrate a person's readiness for promotion or give candidates an edge when securing new roles or contracts. Registration can increase an individual's earning potential and it establishes their credibility with peers across the profession.

Further benefits for individuals are available at: www.engc.org.uk/benefits

Benefits for employers: assurance of quality

Employers can be assured that professionally registered engineers and technicians have:

- had their competence and credentials independently assessed,
- had their credentials verified to an internationally recognised standard, and
- made a commitment to their CPD.

Employing registered professionals can help mitigate against risks and liabilities, as registrants are governed by a Code of Professional Conduct.

Maintaining registration requires continued membership of a Licensee and a commitment to CPD. This means employers can be reassured that registered employees are developing and enhancing their competence and will be exposed to new developments in their profession.

Some employers find the Engineering Council Standards framework to be a useful basis for their own organisational needs, such as to structure CPD. Others rely on achievement of registration to demonstrate an employee's readiness for promotion. In some cases, both in the UK and internationally, the awarding of contracts will require evidence that organisations employ professionally registered engineers.

Further benefits for employers are available at: www.engc.org.uk/employers

International context

The Engineering Council is committed to supporting its professionally registered engineers and technicians working in other countries. Professional registration, as defined in the Standards framework, reflects the requirements of global engineering.

Engineers who have developed their professional engineering competence in countries outside of the United Kingdom are welcome to join the Engineering Council register, subject to meeting the assessment criteria.

For further information see: www.engc.org.uk/international

What is engineering competence?

Competence is defined as a professional's ability to carry out engineering tasks successfully and safely within their field of practice. This includes having the individual skills, knowledge and understanding, personal behaviour and approach, to be able to work collaboratively with others to achieve the intended outcomes. Competence includes the ability to make professional judgments and an awareness of the limits of one's own ability and knowledge in order to seek assistance when required.

Achieving professional registration as ICT*Tech* requires demonstrations of competence in five broad areas:
A. Knowledge and understanding
B. Design, development and solving ICT problems
C. Responsibility, management and leadership
D. Communication and interpersonal skills
E. Personal and professional commitment

What is professional commitment?

Registered engineering professionals are required to demonstrate a personal and professional commitment to society, to the environment and to their profession. As part of demonstrating overall competence, it is mandatory to show that they have adopted a set of values and conduct that maintains and enhances the reputation of the profession. This includes:

- Maintaining public and employee safety
- Undertaking work in a way that protects the environment and contributes to sustainable development
- Complying with codes of conduct, codes of practice and the legal and regulatory framework
- Managing, applying and improving safe systems of work
- Carrying out the CPD necessary to maintain and enhance competence in relation to duties and responsibilities
- Exercising responsibilities in an ethical manner
- Recognising inclusivity and diversity
- Adopting a security-minded approach
- Actively participating within the profession

The Engineering Council has published a CPD Code for Registrants, (see page 24), as well as guidance on risk, sustainability, whistleblowing and security (see pages 26-27).

Ethical standards

Together with the Royal Academy of Engineering, the Engineering Council developed The Statement of Ethical Principles. This document outlines how members of the profession should conduct themselves in their working habits and relationships. The values it is based on should apply in every situation in which engineers and technicians exercise their judgment.

The Statement of Ethical Principles is available at:
www.engc.org.uk/ethics

Further information on the required Standards is available from a variety of sources. Each Licensee will have its own Code of Professional Conduct, in line with the framework on Professional and Ethical Behaviour on page 26 of this document, and supporting guidance.

How to become professionally registered

Professional registration is open to all engineers and technicians who:

- Can satisfy the requirements for underpinning knowledge and understanding
- Can demonstrate competence and commitment to meet the necessary standard
- Are members of a Licensee relevant to their discipline

What are the requirements for registration?

The Engineering Council sets the Standards which need to be met to achieve professional registration. Pages 11–23 show the requirements for ICT*Tech*. However, it is the Licensee that will carry out an assessment of an applicant's competence and commitment. The Licensee will act as the awarding body for professional registration.

Applicants need to apply for professional registration through a Licensee relevant to their discipline. The Licensee will be able to provide details about registration, including the process and typical timescales. The list of Licensees licensed by the Engineering Council is available at: www.engc.org.uk/licensees

A Professional Affiliate is an engineering institution which is closely associated with the Engineering Council but is not licensed to assess applicants or award registration. Some Professional Affiliates will have a registration agreement with a Licensee so that the Licensee can assess members of the Professional Affiliate for registration. These Professional Affiliate members may then apply for registration through the Licensee.

The current list of Professional Affiliates, including those which have registration agreements, is available at: www.engc.org.uk/affiliates

How are applicants assessed?

Pages 11–23 list the requirements for ICT*Tech* registration. Once a person is confident that they meet all the criteria for professional registration, they should make an application for assessment through their chosen Licensee. The assessment process is known as a Professional Review. The Licensee will provide a detailed description of the requirements and format for this.

Applicants will need to submit formal documented evidence of any relevant qualifications, experience or training and show how this relates to the required competences and commitment set out in page 17–23 of this document.

In some engineering disciplines Licensees may specify additional methods of assessing competence and commitment.

Meeting the requirements for registration

Knowledge, understanding and skills form an essential part of competence. This provides the necessary foundation of underpinning logic and analytical capabilities. Knowledge, understanding and skills ensure that decisions are based on a full understanding of engineering practices and standards, rather than relying on instructions.

Formal education is one way of demonstrating the necessary underpinning knowledge and understanding (see Recognised Qualifications, pages 12–14), but it is not the only way (see Individual Assessment, pages 12–14).

Knowledge and understanding requirements

To achieve ICT*Tech* registration, candidates must demonstrate that they have the appropriate technical knowledge. They may have developed this through experience or by gaining technical qualifications.

Holding relevant formal qualifications at the following levels could be one way to demonstrate such knowledge:

- Level 3 of the Qualifications and Credit Framework/National Qualifications Framework for England and Northern Ireland
- Level 6 of the Scottish Credit and Qualifications Framework
- Level 3 of the Credit and Qualifications Framework for Wales

Licensees may approve or accredit other equivalent qualifications and programmes for the purposes of registration. The Engineering Council website provides a searchable database of such approved qualifications and programmes: www.engc.org.uk/courses

However, formal qualifications are not essential for achieving ICT*Tech* professional status. Industry certification, for example certificates awarded by major networks or IT organisations, suppliers and vendors, may support an application and help to demonstrate technical knowledge and understanding.

Those who do not hold any formal qualifications or industry certification may need to provide additional evidence to demonstrate how they have gained technical knowledge.

Alternatively, their company may have implemented the Skills Framework for the Information Age (SFIA), enabling them to undertake a self-assessment of their IT skills, including identification of the relevant supporting evidence. ICT*Tech* registrants would normally be operating at SFIA Level 3 or above, ie a practitioner who requires minimal support and is able to use their own technical skill and knowledge to identify and solve complex problems.

Licensees will be able to offer more information about the SFIA framework and support, should candidates wish to complete a self-assessment of their technical IT skills to determine if they are ready to apply for ICT*Tech*. For more information please see: www.sfia-online.org

Some jurisdictions map qualifications to the UNESCO International Standard Classification of Education (ISCED). For more information please see: http://uis.unesco.org/en/topic/international-standard-classification-education-isced

Figure 1: Assessment process

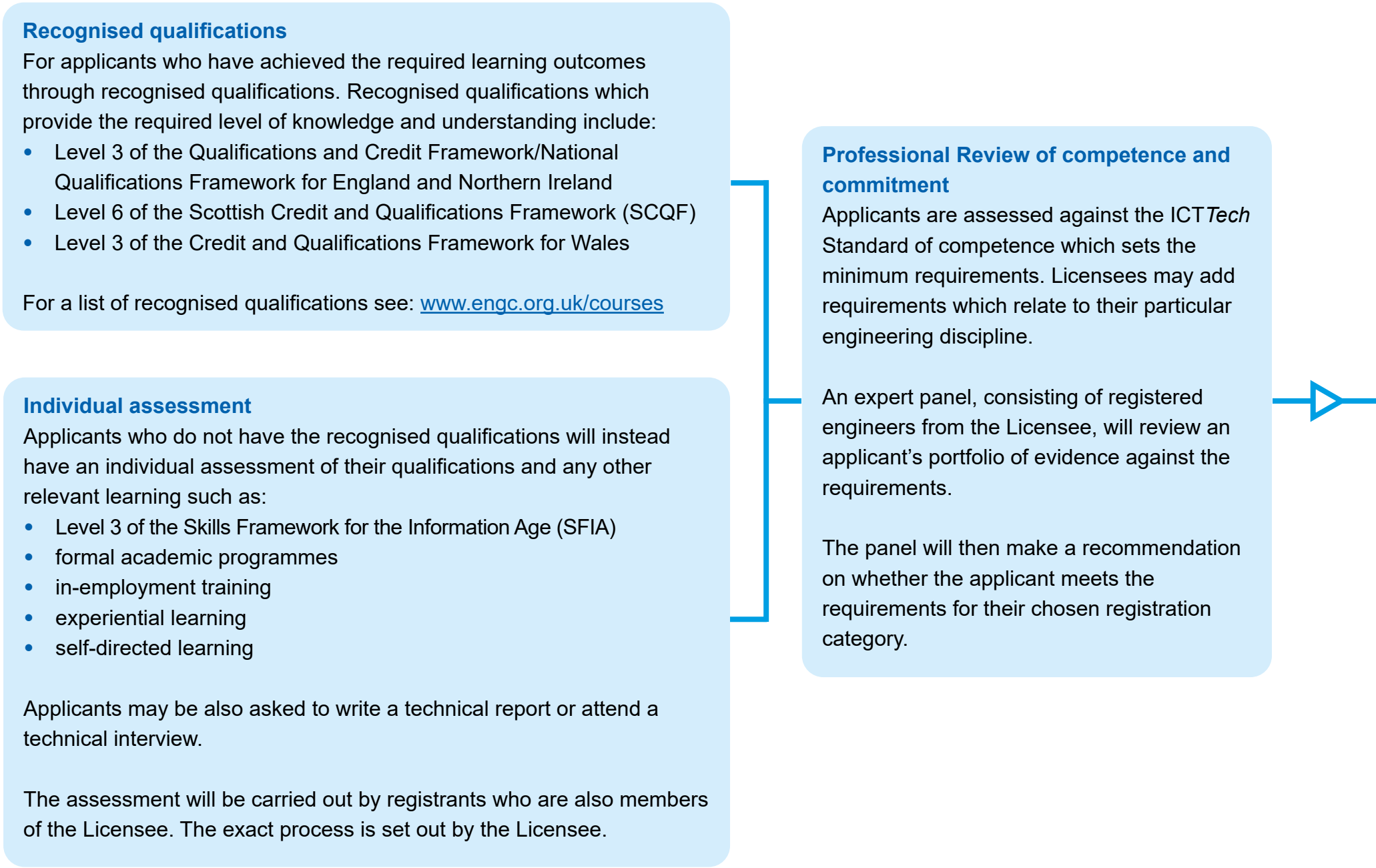


Figure 1 (continued)

Professional registration

The recommendation from the Professional Review is reviewed by the Licensee's relevant committee. The applicant will achieve professional registration if:

- the expert panel recommends that the applicant has met the requirements
- all are satisfied that all stages of the process have been completed, and
- the Licensee's relevant committee endorses the recommendation.

The applicant then becomes a registrant and is able to use the post-nominal ICT*Tech*.

As a condition of continued registration, the individual commits to:

- maintain their competence through CPD and membership of their Licensee, and
- adhere to their Licensee's Code of Professional Conduct.

If an applicant has been unsuccessful the Licensee will provide some guidance on what further learning and experience would be beneficial to achieve registration as an ICT*Tech*.

When all the above steps are completed to the satisfaction of the Licensee's relevant committee, the applicant achieves professional registration. They commit to maintain their CPD and membership of their Licensee and to adhere to their Licensee's Code of Professional Conduct.

Recognised qualifications

A candidate for professional registration may demonstrate that they have the underpinning knowledge and understanding required through holding recognised qualifications.

Programmes may be recognised by Licensees as delivering some, or all, of the knowledge and understanding required for professional registration and/or competence in line with the requirements for achieving professional registration, as set out in the Engineering Council Standards. Recognition is through either **approval** or **accreditation**.

For a list of recognised qualifications see:
www.engc.org.uk/courses

Approval of a programme of learning or apprenticeship attests to its **content**. Approval shows that a programme is subject to External Quality Assurance (EQA) and delivers the learning outcomes and/or competences specified in Engineering Council Standards.

Accreditation of a qualification or programme of learning attests to its **delivery** and is specific to a particular provider at a specific site, or sites. Accreditation shows that a programme of learning delivers the learning outcomes and/or competences specified in Engineering Council Standards. The accreditation process includes a visit by the Licensee to the site of delivery.

Accreditation incorporates Approval: if the delivery of a programme is accredited, approval of the underlying content or syllabus is implicit.

See pages 30–33 for the ICT*Tech* learning outcomes.

Individual assessment

Some potential registrants have not had formal training to the required level but are able to demonstrate they have acquired the necessary underpinning knowledge through substantial work experience. Applicants who have acquired their underpinning knowledge and understanding through experiential learning or other qualifications can submit the relevant information to their Licensee for an initial assessment.

This process includes assessment of the applicant's prior learning and underpinning knowledge needed to successfully perform their role. Applicants should submit information covering their education, career history and training record. It may also be helpful for applicants to include evidence of employer recognition of their competences and relevant skills.

If the Licensee considers, after this initial assessment, that it needs additional evidence of knowledge and understanding it will advise the applicant on the nature and extent of this. An applicant can demonstrate knowledge and understanding in a number of ways, such as:

- Successfully completing further qualifications, either in whole or in part
- Providing a record of having completed work-based or experiential learning
- Writing a technical report, based on experience, which

demonstrates the applicant's knowledge and understanding of engineering principles, or
- Any combination of these

Preparing for registration

Pages 17–23 of this document set out the competence and commitment Standards for registration as an ICT*Tech*.

Engineers seeking registration should review the competence and commitment statements and use the examples to help them identify where they already have an appropriate level of competence, as well as what evidence they can present to demonstrate this. They should also identify areas where they currently lack the appropriate competence, in order to formulate plans to develop to the required level.

Pages 18–23 also include some examples of the kind of evidence which would contribute to demonstrating competence and commitment to the required Standard. However, the list of examples is only for guidance: it is not exhaustive, and the examples are not requirements for achieving professional registration.

Those seeking registration after completing their early career training should present a detailed record of their professional development, responsibilities and experience. To enable applicants to provide the best evidence for the Professional Review, this record should be verified by supervisors or mentors.

Professional Review: assessing competence and commitment

To become professionally registered, applicants must have their competence and commitment assessed through a Professional Review, overseen by the Licensee. This peer review process is carried out by registrants who are competent and trained to carry out this kind of assessment.

Applicants are assessed against the Standard listed in pages 17–23 of this document, which may be adapted by the Licensee to relate specifically to the particular technologies or industries it is concerned with. There is no prescribed time period or minimum age requirement for the development of competence and commitment. The length of time it takes depends on many factors such as a person's prior qualifications or experience, their job role, as well as personal circumstances such as career breaks or part time working.

Scrutiny of qualifications

The first stage of the Professional Review is an assessment of the documented evidence which the applicant has submitted. The applicant's Licensee will specify the requirements for this submission. The Licensee will examine the examples of evidence and assess how they meet the underpinning knowledge, understanding and competence requirements.

Applicants will need to submit evidence in support of their application such as their:
- Educational record and qualifications
- Professional qualifications awarded by other national, regional

or international authorities

- Structured or other professional development
- Areas of responsibility, management and leadership
- Evidence of effective interpersonal skills
- A plan for future professional development

Professional Review

After the submitted evidence has been reviewed, the Licensee will decide whether the applicant is ready to proceed to Professional Review. The Licensee will be able to advise applicants how to best present their evidence of training and experience. If there are shortfalls in evidence, Licensees will usually be able to suggest ways in which the applicant can address them. This may involve further learning, training or additional experience.

When the Professional Review of the submitted documents has been completed, the peer reviewers will make a recommendation to the Licensee's designated committee. The committee will then make a decision on whether the applicant has demonstrated that they meet the required standards. A positive decision will result in registration of the applicant as an ICT*Tech*. Where the applicant has been unsuccessful, the Licensee will provide feedback to help the applicant overcome any shortfalls in competence.

Retention of the title ICT*Tech* requires:

- Continued membership of either:
  - a Licensee licensed for that title or
  - a Professional Affiliate which has a registration agreement with a Licensee licensed for that title,

  and:
- Payment of an annual fee,

  and:
- Undertaking and recording Continuing Professional Development (CPD).

For more information please see: www.engc.org.uk/cpd

The Information and Communications Technology Technician (ICT*Tech*) Standard

Information and Communications Technology Technicians apply proven techniques and procedures to the solution of practical engineering problems.

Information and Communications Technology Technicians shall demonstrate:

- ICT knowledge and understanding to apply technical, practical and systems skills
- Evidence of their contribution to the design, development, configuration, testing, commissioning, installation, deployment, operation, migration or maintenance of ICT solutions, products, processes, systems, services or applications
- Technical and personal responsibility
- Effective communication and interpersonal skills
- The ability to operate in accordance with safe systems of work and to demonstrate appropriate understanding of the principles of sustainability
- Commitment to professional engineering values

An Information and Communications Technology Technician will be able to demonstrate their competence in all of the areas listed, but the depth and extent of their experience and competence will vary with the context, nature and requirements of their role. They will demonstrate a level of competence and commitment in each area, (A1–E5), at a level which is consistent with their specific role. It is to be expected that they will have a higher level of competence in some areas than others and their role may provide limited experience in certain areas. However, they need to demonstrate an understanding of, and familiarity with, the key aspects of competence in those areas of limited experience as a minimum requirement while demonstrating higher levels of competence in those areas which are critical to their role. Overall, they will demonstrate an appropriate balance of competences to perform their role effectively at Information and Communications Technology Technician level.

The examples of evidence are intended as guidance to help identify activities that might demonstrate the required competence and commitment for professional registration as an Information and Communications Technology Technician. They are intended as examples only as the most appropriate evidence will vary with each individual role. The list is not exhaustive and other types of evidence might be valid. There is no requirement to provide multiple examples of evidence for each area of competence, but examples from two or three projects or tasks would be useful.

Competence		Examples of evidence
A. Knowledge and understanding **ICT Technicians shall use ICT knowledge and understanding to apply technical, practical and systems skills.** This competence is about having knowledge of the technologies, standards and practices relevant to the applicant's area of work and having evidence of maintaining and applying this knowledge.	The applicant shall demonstrate that they: 1. Apply ICT principles in an analytical and systematic approach, to solve and review problems and contribute to continuous improvement	• Evaluating potential methods of carrying out an engineering task and selecting the most appropriate solution • Recognising a difficulty and then identifying an approach to resolve it • Identifying an improvement in a technique, procedure, process or method • Interpreting and carrying out test procedures
	2. Review, select and use appropriate techniques, procedures and methods to undertake activities.	• Drawing on your technical knowledge to complete a task • Performing calculations using standard formulae • Analysing performance or test data or comparing performance information with published material • Applying knowledge of modelling packages and an ability to use them to solve problems

Competence		Examples of evidence
B. Design, development and solving ICT problems **ICT Technicians shall contribute to the design, development, configuration, testing, commissioning, installation, deployment, operation, migration or maintenance of ICT solutions, products, processes, systems, services or applications.** This competence is about the ability to apply ICT knowledge effectively and efficiently to the individual tasks which need to be undertaken in the applicant's role.	The applicant shall demonstrate that they: 1. Identify and/or respond to problems with ICT solutions, services or infrastructure and apply suitable methods to seek the causes and to achieve the development of satisfactory solutions	• Using knowledge to identify a problem or an opportunity for improvement • Investigating a problem to identify the underlying cause • Identifying a solution to a problem or an improvement opportunity • Contributing to the design of an item or process
	2. Identify, organise and use resources effectively to complete ICT tasks, with consideration for factors such as cost, performance, confidentiality, security, quality and availability of service, health, safety and environmental impact. **or** Configure or maintain ICT systems to provide satisfactory performance and quality of service. **or** Secure and protect ICT systems from intrusion, damage, attack or data loss.	• Balancing these factors in selecting appropriate materials • Identifying precautions as a result of evaluating risks and other factors • Considering how waste can be minimised, recycled or disposed of safely if recycling is not possible • Contributing to best practice methods of continuous improvement • Improving the quality of an operation or process • Ability to tailor and run simulation and other models • Ability to solve software and/or related technical problems under general guidance from more senior staff • Knowledge of LAN/WAN: installing equipment and software, upgrading, configuration, testing • System administration tasks in line with manufacturers requirements

Competence		Examples of evidence
C. Responsibility, management and leadership **ICT Technicians shall accept and exercise personal responsibility.** This competence is about the ability to plan and manage the applicant's own work effectively and efficiently. It is also about the ability to consider and identify improvements to maintain quality in their work.	The applicant shall demonstrate that they: 1. Work reliably and effectively on ICT tasks without close supervision and by adhering to the job instructions or best practice	• Completing challenging tasks successfully within your area of work • Identifying issues which fall outside of your current knowledge and seeking advice • Identifying standards and codes of practice relevant to a new task
	2. Accept responsibility for the work of themselves or others	• Fully understanding drawings, permits to work, instructions or other similar documents after appropriate checking, and identifying issues • Inspecting work carried out by others • Checking the status of equipment, the work environment and facilities and taking appropriate actions before commencing work
	3. Accept, allocate or supervise technical and other tasks	• Ensuring that the scope of a task is clear before accepting and/or allocating it to others • Querying any aspect of a task which is not clear and/ or providing an explanation if a query is raised by others • Learning from your own experience and/or providing constructive feedback when supervising or working with others
	4. Be aware of and/or involved in continuous quality improvement.	• Demonstrate how you have contributed to relevant quality audits and where you have delivered against a quality improvement action • Examples of where you have reported a problem which has subsequently improved a process

Competence		Examples of evidence
D. Communication and interpersonal skills **ICT Technicians shall use effective communication and interpersonal skills.** This is the ability to work with others constructively, to explain ideas and proposals clearly and to discuss issues objectively and constructively.	**The applicant shall demonstrate that they:** 1. Communicate technical and other information effectively in English[1]	• Contributing to meetings and discussions • Preparing communications, documents and reports on technical matters • Exchanging information and providing advice to technical and non-technical colleagues • Examples of different kinds of documents and/or presentations you have prepared or contributed to with an emphasis on those that include technical information about an ICT solution, system, process or hardware or software component • Give examples of where you have had to prepare documents or presentations for technical and non-technical audiences or recipients
	2. Work effectively with colleagues, clients, suppliers or the public	• Contributing constructively as part of a team • Successfully resolving issues in discussions with team members, suppliers, clients and/or others • Persuading others to accept suggestions or recommendations • Identifying, agreeing and working towards collective goals
	3. Be aware of the needs and concerns of others, demonstrate personal and social skills and awareness of diversity and inclusion issues.	• Knowing and managing own emotions, strengths and weaknesses • Being confident and flexible in dealing with new and changing interpersonal situations • Creating, maintaining and enhancing productive working relationships, and resolving conflicts • Being supportive of the needs and concerns of others, especially where this relates to diversity and inclusion

1 Any interviews will be conducted in English, subject only to the provisions of the Welsh Language Act 1993.

Competence		Examples of evidence
E. Personal and professional commitment **ICT Technicians shall demonstrate commitment to an appropriate code of professional conduct, recognising obligations to society, the profession and the environment.** This competence is about ensuring that the applicant is acting in a professional manner in their work and in their dealings with others. An ICT Technician should set a standard and example to others with regard to professionalism.	The applicant shall demonstrate that they: 1. Understand and comply with relevant codes of conduct and regulations/standards	• Demonstrating compliance with your Licensee's Code of Professional Conduct • Working within all relevant legislative and regulatory frameworks, including social and employment legislation
	2. Manage and apply healthy, safe, secure systems of work, and be aware of appropriate hazard identification and risk management systems. This could include an ability to: • Identify and take responsibility for own obligations for health, safety and welfare issues • Apply systems that satisfy health, safety and welfare requirements	• Providing evidence of applying current safety requirements, such as risk assessment and other examples of good practice you adopt in your work • A sound knowledge of health and safety legislation, for example: HASAW 1974, CDM regulations, ISO 45001 and company safety policies • Recognising how sustainability principles, as described in the Guidance on Sustainability on page 26, can be applied in your day-to-day work • Identifying actions that you can and have taken to improve sustainability • Demonstrating awareness of environmental sustainability and the general recognition of sustainability

Competence		Examples of evidence
E. Personal and professional commitment (continued)	3. Show you are aware of and apply good practices that protect other people, organisations or the environment from harm caused by the operation of ICT systems. Undertake ICT work in a way that contributes to sustainable development	• Understanding the ethical issues that you may encounter in your role • Giving an example of where you have applied ethical principles as described in the Statement of Ethical Principles on page 26 • Giving an example of where you have applied or upheld ethical principles as defined by your organisation or company
	4. Carry out and record CPD necessary to maintain and enhance competence in ICT including: • Undertake reviews of own development needs • Plan how to meet personal and organisational objectives • Carry out planned and unplanned CPD activities • Maintain evidence of competence development. • Evaluate CPD outcomes against any plans made • Assist others with their own CPD	• Undertaking reviews of your own development needs • Planning how to meet personal and organisational objectives • Carrying out and recording planned and unplanned CPD activities • Maintaining evidence of competence development • Evaluating CPD outcomes against any plans made • Assisting others with their own CPD

Continuing Professional Development

Continuing professional development (CPD) is essential for maintaining and enhancing the required competence and commitment, as well as for developing new competences. This obligation underpins the value of the professional registration titles and enables society to have confidence in the engineering profession.

CPD has several purposes:

- To assure continuing competence in a current job
- To prepare for a different role
- To follow a longer-term career development plan
- To enhance professionalism in a wider context than a specific job role.

More details on the nature, purpose and value of CPD can be found in the CPD Policy Statement. For more information please see: www.engc.org.uk/cpd

CPD Code for Registrants

Engineering professionals should take all necessary steps to maintain and enhance their competence through CPD. In particular, they should:

- Take ownership of their learning and development needs and develop a plan to indicate how they might meet these, in discussion with their employer, as appropriate
- Carry out a variety of development activities, both in accordance with this plan and in response to other opportunities which might arise
- Record their CPD activities
- Reflect on what they have learned or achieved through their CPD activities and record these reflections
- Evaluate their CPD activities against any objectives they have set and record this evaluation
- Review their learning and development plan regularly, following reflection and assessment of future needs
- Support the learning and development of others through activities such as mentoring and sharing professional expertise and knowledge

At Professional Review, all applicants will need to demonstrate how they meet their CPD obligations and show that they understand that this requires an ongoing commitment.

Sampling registrants' CPD records

The Licensees undertake annual random samples of professionally active registrants' CPD records and provide appropriate feedback, as described in the Engineering Council's Registration Code of Practice (RCoP).

Registrants who are not professionally active (eg retired or on a career break) may request exemption from a sample. The intention behind CPD sampling is not to police registrants, but to encourage a culture in which registrants will naturally engage in CPD and take ownership of their own learning and development.

Recording evidence of CPD undertaken is a requirement of professional registration. Professionally active registrants who persistently do not respond to or engage with requests for CPD records from a Licensee will be removed from the Engineering Council Register.

Professional and ethical behaviour

Statement of Ethical Principles

Engineering professionals work to enhance the wellbeing of society. In doing so they are required to maintain and promote high ethical standards and challenge unethical behaviour.

The Statement of Ethical Principles, published by the Engineering Council and the Royal Academy of Engineering, lists four fundamental principles to guide engineers and technicians in their professional life.

The Statement of Ethical Principles is available at: www.engc.org.uk/ethics

Guidance for Licensee Codes of Professional Conduct

All registrants are expected to observe the requirements of the Code of Professional Conduct (the Code) of the Licensee they have joined. This Code of Professional Conduct places a personal obligation on its members to act with integrity and in the public interest, in accordance with the Statement of Ethical Principles.

Each Licensee will have appropriate disciplinary processes in place to address breaches of their Code of Professional Conduct.

For more information please see: www.engc.org.uk/conduct

Guidance on Risk

This guidance, published by the Engineering Council, lists six principles to guide and motivate professional engineers and technicians in identifying, assessing, managing and communicating about risk.

For more information please see: www.engc.org.uk/risk

Guidance on Sustainability

This guidance, published by the Engineering Council, lists six principles to guide and motivate professional engineers and technicians when making decisions for clients, employers and society which affect sustainability.

For more information please see: www.engc.org.uk/sustainability

Guidance on Whistleblowing

This guidance, published by the Engineering Council, explains what whistleblowing is and the processes that engineers and technicians should follow when confronted with a potential whistleblowing situation.

For more information please see: www.engc.org.uk/whistleblowing

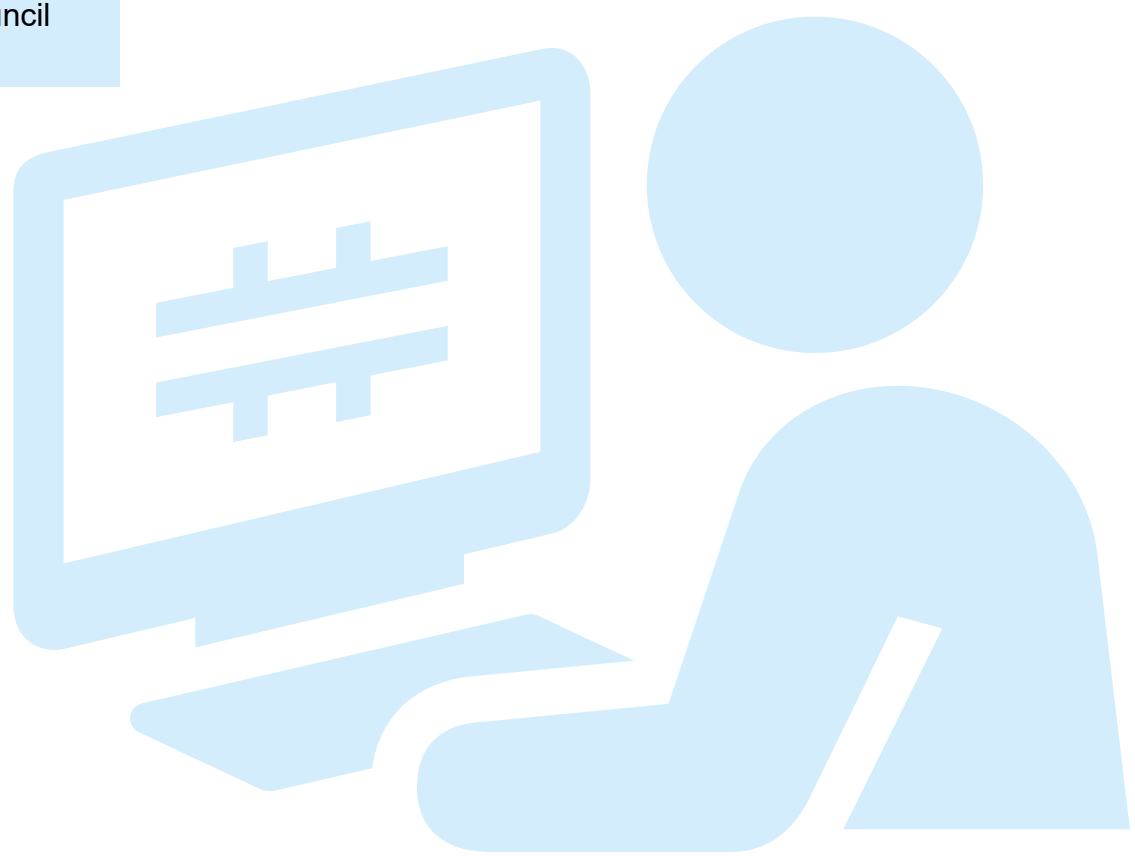
Guidance on Security

This guidance, published by the Engineering Council, lists six key principles to guide engineers and technicians in identifying, assessing, managing and communicating issues about security.

For more information please see: www.engc.org.uk/security

The Engineering Council reviews its guidance periodically and welcomes comments about this. Licensees may use this to assist them in developing guidance for their members.

For the latest information please see the Engineering Council website: www.engc.org.uk



International Activity

To ensure that professionally registered engineers' skills are recognised internationally, the Engineering Council is active within a number of multilateral mutual recognition agreements with other national engineering bodies. These agreements establish internationally benchmarked standards which allow signatory bodies to recognise each other's academic and professional qualifications, aiding mobility. In particular, the Engineering Council was a founder member of the Washington Accord and has subsequently worked with international partners to develop further agreements. The governance of these sits within the International Engineering Alliance (IEA).

The Engineering Council is a member of:

- The Agreement for International Engineering Technicians (AIET)
- The Dublin Accord (DA)
- The International Engineering Technologists Agreement (IETA)
- The International Professional Engineers Agreement (IPEA)
- The Sydney Accord (SA)
- The Washington Accord (WA)

The Engineering Council is a member of the European Network of Accreditation of Engineering Education (ENAEE), which authorises accreditation and quality assurance agencies to award the EURACE® label to accredited engineering degree programmes. In addition, the Engineering Council works within the European Federation of National Engineering Associations (FEANI) to strengthen the voice of engineers at the European level.

For more information please see: www.engc.org.uk/international

Defining characteristics of approved and accredited programmes

The defining characteristics presented in ICT*Tech* are common to those presented in AAQA for EngTech recognition.

National Certificates/Diplomas and equivalent qualifications accredited or approved as fully meeting the academic requirement for ICT*Tech* registration

ISCED: **Level 3**
EQF: **Level 4**

National Certificates/Diplomas or equivalent qualifications accredited for the purpose of ICT*Tech* registration will have an emphasis on the practical application of current and developing technology.

An individual who has completed a National Certificate/Diploma or equivalent qualification or apprenticeship 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 well-defined programmes of work and associated problems using established principles and techniques.

Learning outcomes

Preamble

1. Well-defined problems involve several factors, but with few of these exerting conflicting constraints, and can be solved through the standardised application of engineering science.
2. These learning outcomes are threshold standards and should be interpreted in the context of a particular disciplinary or multidisciplinary engineering practice, and the level of study.
3. 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.
4. It is recognised that an approved or accredited programme may develop learning outcome(s) beyond the threshold level, however such additional learning is not prescribed or required for academic accreditation.
5. 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, Initial Professional Development Schemes, etc.).
6. 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	ICT*Tech* Learning Outcome number (ICTLO)	On successful completion of an accredited or approved 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.	1	**Science, mathematics and engineering principles** Apply knowledge of mathematics, statistics, natural science and engineering principles to well-defined ICT problems.
Engineering analysis Engineering analysis involves the application of engineering concepts and tools to analyse, model and solve engineering or ICT problems. At higher levels of study engineers will work with information that may be uncertain or incomplete.	2	**Problem analysis** Analyse well-defined problems, reaching substantiated conclusions.
	3	**Analytical tools and techniques** Use appropriate computational and analytical tools and techniques to solve well-defined problems.
	4	**Technical literature** Select and use technical literature and other sources of information to address well-defined engineering or ICT problems specific to their field of activity.
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.	5	**Design** Contribute to design solutions for well-defined engineering or ICT (technical) problems and assist with the design of systems, components or processes to meet business, customer or user 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.
	6	**Legal/contractual** Demonstrate awareness of relevant legal requirements governing engineering or ICT activities, including personnel, health and safety, contracts, intellectual property rights, product safety and liability issues.

Area of learning	ICT*Tech* Learning Outcome number (ICTLO)	On successful completion of an accredited or approved 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.	7	**Sustainability** Understand the requirement for engineering or ICT activities to promote sustainable development.
	8	**Ethics** Understand the need for a high level of professional and ethical conduct in engineering or ICT and demonstrate a knowledge of professional codes of conduct.
	9	**Risk** Identify, evaluate and mitigate risks (the effects of uncertainty) specific to their field of activity.
	10	**Security** Adopt a holistic and proportionate approach to the mitigation of security risks.
	11	**Equality, diversity and inclusion** Recognise the importance of equality, diversity and inclusion in the workplace.

Area of learning	ICT*Tech* Learning Outcome number (ICTLO)	On successful completion of an accredited or approved 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.	12	**Materials, equipment, technologies and processes** Select and apply appropriate materials, equipment, engineering technologies, processes, codes of practice and industry standards to plan and undertake well-defined programmes of work.
	13	**Quality management** Recognise the need for quality management systems and continuous improvement in the context of well-defined problems.
	14	**Engineering and project management** Demonstrate awareness of engineering management principles, commercial and economic context, and project management.
	15	**Teamwork** Function effectively as an individual and as a member of a team.
	16	**Communication** Communicate effectively with technical and non-technical audiences.
	17	**Lifelong learning** Plan and record self-learning and improve performance, as the foundation for lifelong learning/CPD.

Glossary

AAQA	**Approval and Accreditation of Qualifications and Apprenticeships**. One of the Standards which the Engineering Council publishes, along with **AHEP**, **ICT*Tech* Standard**, **RCoP** and **UK-SPEC**. AQAA 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
Accredited	An accredited **programme** of learning is one which has been peer reviewed in a specified location, against published **learning outcomes** and/or **competence**, including a review of delivery, assessment and facilities. This usually applies to programmes that are not assured externally. This usually involves a visit from a team of professional engineers nominated by **Licensees**. See also: **Approved**. For a list of **recognised qualifications** see: www.engc.org.uk/courses
AHEP	**Accreditation of Higher Education Programmes**. One of the **Standards** which the **Engineering Council** publishes, along with **AAQA**, the **ICT*Tech* Standard**, **RCoP** and **UK-SPEC**. Working in line with UK-SPEC, AHEP sets out the standards for the **accreditation** of higher education **programmes** in engineering. It also outlines the application process for universities that wish to secure or maintain accreditation of their programmes. Accreditation is carried out by **Licensees** in accordance with these requirements. See: www.engc.org.uk/ahep
Approved	An approved qualification or apprenticeship has been peer reviewed against published **learning outcomes** and/or **competence**, for which an external body (which may be a **Licensee**) quality assures delivery, assessment, and facilities. Approval does not require a visit. See also: **Accredited**. For a list of **recognised qualifications** see: www.engc.org.uk/courses
CDM Regulations	Construction (Design and Management) Regulations 2015, known as CDM Regulations or CDM 2015, are UK regulations governing construction projects of any type and size. CDM Regulations define responsibilities and place legal duties, enforceable by criminal law, on all parties involved in a construction project.

Chartered Engineer (CEng)	One of the **professional titles** available to individuals who meet the required standards of **competence** and **commitment**. See: www.engc.org.uk/ceng
Code of Professional Conduct	Every **Licensee** and **Professional Affiliate** which is licensed by the **Engineering Council** will have its own Code of Professional Conduct. One of the requirements of **professional registration** is demonstrating compliance with the appropriate organisation's Code. See page 26.
Commitment	A set of values, rules of conduct, and obligations that maintain and enhance the reputation of the engineering profession and the individual. Demonstrating both **competence** and commitment is part of the requirement to become **professionally registered** with the **Engineering Council**.
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**.

CPD	**Continuing Professional Development**. The systematic acquisition of knowledge and skills, and the development of personal qualities, to maintain and enhance professional **competence** for current and future roles. All members of **Licensees** have an obligation to carry out CPD and to support the learning of others. See: www.engc.org.uk/cpd
Documented evidence	The written and documented evidence of experience and qualifications which is submitted for a **Professional Review** when applying for **professional registration**.
Engineering Council	The UK regulatory body for the engineering profession. The Engineering Council sets and maintains internationally recognised standards of professional **competence** and ethics (the Standards) and holds the UK register of professional engineers and technicians. www.engc.org.uk
Engineering Technician (EngTech)	One of the **professional titles** available to individuals who meet the required standards of **competence** and **commitment**. See: www.engc.org.uk/engtech
HASAW	Health and Safety at Work. Specifically, the 1974 Health and Safety at Work Act, the primary legislation covering occupational health and safety in the UK.
ICT	Information and Communications Technology.

ICT*Tech*	An **Information and Communications Technology Technician**. One of the **professional registration** titles available to individuals who meet the required standards of **competence** and **commitment**. See also: **ICT*Tech* Standard**.
ICT*Tech* Standard	The **Information and Communications Technology Technician Standard**. This document, which sets out the competence and commitment requirements for registration as an Information and Communications Technology Technician (**ICT*Tech***). The ICT*Tech* Standard is one of the Standards which the **Engineering Council** publishes, along with **AAQA**, **AHEP**, **UK-SPEC** and **RCoP**. See: www.engc.org.uk/icttech See also: **ICT*Tech***.
Incorporated Engineer (IEng)	One of the **professional titles** available to individuals who meet the required standards of **competence** and **commitment**. See: www.engc.org.uk/ieng
Individual assessment	The route to **professional registration** for individuals without recognised qualifications. See page 14. The other way to achieve professional registration is through **Recognised Qualifications**.
ISCED	The UNESCO **International Standard for Classification of Education (ISCED)** is designed to serve as a framework to classify educational activities, as defined in **programmes** and the resulting qualifications, into internationally agreed categories.
ISO	The International Organization for Standardization. ISO publishes documents such as ISO 45001 the international standard for occupational health and safety and ISO 9000, the international quality standards on quality management and quality assurance.
Learning outcome	A statement of achievement expected of an individual who has completed an **approved** or **accredited** qualification or apprenticeship.
Licensee	Membership organisation which is licensed by the **Engineering Council** to assess candidates for **professional registration**. Some institutions also have a licence to **approve** or **accredit** qualifications and apprenticeships. Also known as Professional Engineering Institutions or PEIs. See: www.engc.org.uk/licensees
May	In the context of the requirements set out in the Standards, 'may' indicates there is permission to do something. See also: **Shall**, **Should**.
National engineering bodies	National engineering bodies responsible for regulation of the profession, such as the **Engineering Council**.

Post-nominal	Letters placed after a person's name which indicate that the person holds a certain position, academic degree, professional accreditation, office or honour. Examples of engineering post-nominals include **ICT*Tech***, **EngTech**, **IEng** or **CEng**.
Professional Affiliate	An incorporated body or engineering institution which is closely associated with, but not licensed by, the **Engineering Council**. It may enter into an agreement with a **Licensee** to process its members for **professional registration**. For a full and current list of Professional Affiliates see: www.engc.org.uk/affiliates
Professional development	The process by which an individual gains professional **competence**. It may take place through formal and informal learning, and workplace training and experience.
Professional engineering institution	See **Licensee**.

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**.
Professional review	A peer assessment process to decide whether an individual has met the requirements for **professional registration**. It is a holistic assessment of the applicant's **competence** and **commitment** against the relevant **Engineering Council** Standards. For **ICT*Tech*** these are set out in the **ICT*Tech* Standard** page 11-23.
Professional title	A professional title establishes a person's proven knowledge, understanding and **competence** to a set standard and demonstrates their **commitment** to developing and enhancing competence. The **Engineering Council** licenses the professional titles **CEng**, **EngTech**, **ICT*Tech*** and **IEng**.

Programme	A programme of learning, such as a qualification or apprenticeship.
RCoP	**Registration Code of Practice**. One of the Standards which the **Engineering Council** publishes, along with **AAQA**, **AHEP**, the **ICT*Tech* Standard** and **UK-SPEC**. RCoP sets out the rules, for **Licensees**, on the process of awarding **professional registration** titles such as **ICT*Tech***, **EngTech**, **IEng** or **CEng**.
Recognised qualifications	Qualifications that are recognised as delivering the appropriate **learning outcomes** to develop an individual's **underpinning knowledge and understanding** for **professional registration**. See also: **Individual Assessment**.
Recognition	**Programmes** may be recognised by **Licensees** as delivering some, or all, of the knowledge and understanding required for **professional registration** and/or competence either in-line with the full requirements for a **professional title** or at the threshold level set out in **AAQA**. Recognition is through **approval** or **accreditation**.
Registrant	An individual who holds a **professional registration** title such as **ICT*Tech***, **EngTech**, **IEng** or **CEng**.
Registration	See **Professional Registration**.
Royal Academy of Engineering (RAEng)	The UK's national academy for engineering that works to advance and promote excellence in engineering. RAEng provides analysis and policy support relating to business and education, invests in the UK's research base to underpin innovation, and works to improve public awareness and understanding of engineering. See: www.raeng.org.uk
Royal Charter	A formal document issued by the monarch granting rights and powers to an individual or an organisation.
SFIA	**Skills Framework for the Information Age**. See: www.sfia-online.org
Shall	In the context of the requirements set out in the **Standards**, 'shall' indicates there is a requirement to do something (ie it is mandatory). See also: **May**, **Should**.
Should	In the context of the requirements set out in the **Standards**, 'should' indicates a recommendation to do something. See also: **May**, **Shall**.
Statement of Ethical Principles	Published by the **Engineering Council** and the **Royal Academy of Engineering**. Engineering professionals should read the Statement of Ethical Principles in conjunction with their relevant **Code of Professional Conduct**. See page 26 or www.engc.org.uk/ethics

UK-SPEC	**The UK Standard for Professional Engineering Competence and Commitment** sets out the **competence** and **commitment** requirements for **registration** as an **EngTech**, **IEng** or **CEng**. UK-SPEC is one of the Standards which the **Engineering Council** publishes, along with **AAQA**, **AHEP**, the **ICT*Tech* Standard** and **RCoP**.
Underpinning knowledge and understanding	The knowledge and understanding of the principles of science, mathematics and engineering theory that are required to form the basis of engineering **competence** at a professional level.

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