



## The Chartered Engineer Standard (CEng)

Chartered Engineers develop solutions to engineering problems using new or existing technologies, through innovation, creativity and change. They may be accountable for complex systems with significant levels of risk, Chartered Engineers are able to demonstrate:

- The theoretical knowledge to solve problems in new technologies and develop new analytical techniques
- Successful application of the knowledge to deliver innovative products and services and/or take technical responsibility for complex engineering systems
- Responsibility for financial and planning aspects of projects, sub-projects or tasks
- Leadership and development of other professional staff through management, mentoring or coaching
- Effective interpersonal skills in communicating technical matters.
- Understanding of the safety and sustainability implications of their work, seeking to improve aspects where feasible
- Commitment to professional engineering values

#### The Chartered Engineer (CEng) Standard

Chartered Engineers develop solutions to complex engineering problems using new or existing technologies, through innovation, creativity and technical analysis.

Chartered Engineers shall demonstrate:

The examples given below are intended to help you identify activities you might quote to demonstrate the required competence and commitment for CEng registration. These are not exhaustive. Moreover, you are not required to give multiple examples to demonstrate competence and commitment, but examples from two or three projects or tasks would be useful.

#### A Knowledge and understanding

Chartered Engineers shall use a combination of general and specialist engineering knowledge and understanding to optimise the application of advanced and complex systems.

#### Examples of evidence

**A1** Have maintained and extended a sound theoretical approach to enable them to develop their particular role

- Formal training related to your role
- Learning and developing new engineering knowledge in a different industry or role
- Understanding the current and emerging technology and technical best practice in your area of expertise
- Developing a broader and deeper knowledge base through research and experimentation
- Learning and developing new engineering theories and techniques in the workplace

<p><b>A2</b> Are developing technological solutions to unusual or challenging problems, using their knowledge and understanding and/or dealing with complex technical issues or situations with significant levels of risk.</p>	<ul style="list-style-type: none"> <li>– Carrying out technical research and development</li> <li>– Developing new designs, processes or systems based on new or evolving technology</li> <li>– Carrying out complex and/or non-standard technical analyses</li> <li>– Developing solutions involving complex or multidisciplinary technology</li> <li>– Developing and evaluating continuous improvement systems</li> <li>– Developing solutions in safety-critical industries or applications</li> </ul>
<p><b>B</b> <b>Design, development and solving, engineering problems.</b></p> <p>Chartered Engineers shall apply appropriate theoretical and practical methods to the analysis and solution of engineering problems.</p>	<p><b>Examples of evidence</b></p>
<p><b>B1</b> Take an active role in the identification and definition of project requirements, problems and opportunities</p>	<ul style="list-style-type: none"> <li>– Identifying projects or technical improvements to products, processes or systems</li> <li>– Preparing specifications, taking account of functional and other requirements</li> <li>– Establishing user requirements</li> <li>– Reviewing specifications and tenders to identify technical issues and potential improvements</li> <li>– Carrying out technical risk analysis and identifying mitigation measures</li> <li>– Considering and implementing new and emerging technologies</li> </ul>
<p><b>B2</b> Can identify the appropriate investigations and research needed to undertake the design, development and analysis required to complete an engineering task and conduct these activities effectively.</p>	<ul style="list-style-type: none"> <li>– Identifying and agreeing appropriate research methodologies</li> <li>– Investigating a technical issue, identifying potential solutions and determining the factors needed to compare them</li> <li>– Identifying and carrying out physical tests or trials and analysing and evaluating the results</li> <li>– Carrying out technical simulations or analysis</li> <li>– Preparing, presenting and agreeing design recommendations, with appropriate analysis of risk, and taking account of cost, quality, safety, reliability, accessibility, appearance, fitness for purpose, security (including cyber security), intellectual property constraints and opportunities, and environmental impact</li> </ul>

**B3** Can implement engineering tasks and evaluate the effectiveness of engineering solutions.

- Ensuring that the application of the design results in the appropriate practical outcome
- Implementing design solutions, taking account of critical constraints, including due concern for safety, sustainability and disposal or decommissioning
- Identifying and implementing lessons learned
- Evaluating existing designs or processes and identifying faults or potential improvements including risk, safety and life cycle considerations
- Actively learning from feedback on results to improve future design solutions and build best practice

## **C Responsibility, management and leadership.**

Chartered Engineers shall demonstrate technical and commercial leadership.

### **Examples of evidence**

**C1** Plan the work and resources needed to enable effective implementation of a significant engineering task or project.

- Preparing budgets and associated work programmes for projects or tasks
- Systematically reviewing the factors affecting the project implementation including safety, sustainability and disposal or decommissioning considerations
- Carrying out a task or project risk assessment and identifying mitigation measures
- Leading on preparing and agreeing implementation plans and method statements
- Negotiating and agreeing arrangements with customers, colleagues, contractors and other stakeholders, including regulatory bodies
- Ensuring that information flow is appropriate and effective

**C2** Manage (organise, direct and control), programme or schedule, budget and resource elements of a significant engineering task or project.

- Operating or defining appropriate management systems including risk registers and contingency systems
- Managing the balance between quality, cost and time
- Monitoring progress and associated costs and cost forecasts, taking appropriate actions when required
- Establishing and maintaining appropriate quality standards within legal and statutory requirements
- Interfacing effectively with customers, contractors and other stakeholders

<p><b>C3</b> Lead teams or technical specialisms and assist others to meet changing technical and managerial needs.</p>	<ul style="list-style-type: none"> <li>– Agreeing objectives and work plans with teams and individuals</li> <li>– Reinforcing team commitment to professional standards</li> <li>– Leading and supporting team and individual development</li> <li>– Assessing team and individual performance, and providing feedback</li> <li>– Seeking input from other teams or specialists where needed and managing the relationship</li> <li>– Providing specialist knowledge, guidance and input in your specialism to engineering teams, engineers, customers, management and relevant stakeholders</li> <li>– Developing and delivering a teaching module at Masters level, or leading a University research programme</li> </ul>
<p><b>C4</b> Bring about continuous quality improvement and promote best practice.</p>	<ul style="list-style-type: none"> <li>– Promoting quality throughout the organisation as well as its customer and supplier networks</li> <li>– Developing and maintaining operations to meet quality standards eg ISO 9000, EQFM</li> <li>– Supporting or directing project evaluation and proposing recommendations for improvement</li> <li>– Implementing and sharing the results of lessons learned</li> </ul>
<p><b>D</b> <b>Communication and interpersonal skills.</b></p> <p>Chartered Engineers shall demonstrate effective communication and interpersonal skills.</p>	<p><b>Examples of evidence</b></p>
<p><b>D1</b> Communicate effectively with others, at all levels, in English.</p>	<ul style="list-style-type: none"> <li>– Preparing reports, drawings, specifications and other documentation on complex matters</li> <li>– Leading, chairing, contributing to and recording meetings and discussions</li> <li>– Exchanging information and providing advice to technical and non-technical colleagues</li> <li>– Engaging or interacting with professional networks</li> </ul>
<p><b>D2</b> Clearly present and discuss proposals, justifications and conclusions.</p>	<ul style="list-style-type: none"> <li>– Contributing to scientific papers or articles as an author</li> <li>– Preparing and delivering presentations on strategic matters</li> <li>– Preparing bids, proposals or studies</li> <li>– Identifying, agreeing and leading work towards collective goals</li> </ul>

<sup>1</sup>Any interviews will be conducted in English, subject only to the provisions of the Welsh Language Act 1993 and any Regulations which may be made in implementation of European Union directives on free movement of labour.

**D3** 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
- Identifying, agreeing and working towards collective goals
- 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

**E Personal and professional commitment.**

Chartered Engineers shall demonstrate a personal commitment to professional standards, recognising obligations to society, the profession and the environment.

**Examples of evidence**

**E1** Understand and comply with relevant codes of conduct.

- Demonstrating compliance with your Licensee's Code of Professional Conduct
- Identifying aspects of the Code which are particularly relevant to your role
- Being aware of the legislative and regulatory frameworks relevant to your role and how they conform to them
- Leading work within relevant legislation and regulatory frameworks, including social and employment legislation

**E2** Understand the safety implications of their role and manage, apply and improve safe systems of work.

- Identifying and taking responsibility for your own obligations and ensuring that others assume similar responsibility for health, safety and welfare issues
- Ensuring that systems satisfy health, safety and welfare requirements
- Developing and implementing appropriate hazard identification and risk management systems and culture
- Managing, evaluating and improving these systems
- Applying a sound knowledge of health and safety legislation, for example: HASAW 1974, CDM regulations, ISO 45001 and company safety policies

<b>E3</b> Understand the principles of sustainable development and apply them in their work.	<ul style="list-style-type: none"><li>– Operating and acting responsibly, taking account of the need to progress environmental, social and economic outcomes simultaneously</li><li>– Providing products and services which maintain and enhance the quality of the environment and community, and meet financial objectives</li><li>– Recognising how sustainability principles, as described in the Guidance on Sustainability on page 48, can be applied in your day-to-day work</li><li>– Understanding and securing stakeholder involvement in sustainable development</li><li>– Using resources efficiently and effectively in all activities</li><li>– Taking action to minimise environmental impact in your area of responsibility</li></ul>
<b>E4</b> Carry out and record the Continuing Professional Development (CPD) necessary to maintain and enhance competence in their own area of practice	<ul style="list-style-type: none"><li>– Undertaking reviews of your own development needs</li><li>– Planning how to meet personal and organisational objectives</li><li>– Carrying out planned and unplanned CPD activities</li><li>– Maintaining evidence of competence development</li><li>– Evaluating CPD outcomes against any plans made</li><li>– Assisting others with their own CPD</li></ul>
<b>E5</b> Understand the ethical issues that may arise in their role and carry out their responsibilities in an ethical manner.	<ul style="list-style-type: none"><li>– Understanding the ethical issues that you may encounter in your role</li><li>– Giving an example of where you have applied ethical principles, as described in the Statement of Ethical Principles on page 47</li><li>– Giving an example of where you have applied or upheld ethical principles as defined by your organisation or company</li></ul>

## Contact information

### London, UK

**T** +44 (0)20 7344 8460

**E** [faradaycentre@ietvenues.co.uk](mailto:faradaycentre@ietvenues.co.uk)

### Stevenage, UK

**T** +44 (0)1438 313311

**E** [postmaster@theiet.org](mailto:postmaster@theiet.org)

### Beijing, China\*

**T** +86 10 6566 4687

**E** [china@theiet.org](mailto:china@theiet.org)

**W** [theiet.org.cn](http://theiet.org.cn)

### Hong Kong SAR

**T** +852 2521 2140

**E** [infoAP@theiet.org](mailto:infoAP@theiet.org)

### Bangalore, India

**T** +91 80 4089 2222

**E** [india@theiet.in](mailto:india@theiet.in)

**W** [theiet.in](http://theiet.in)

### New Jersey, USA

**T** +1 (732) 321 5575

**E** [ietusa@theiet.org](mailto:ietusa@theiet.org)

**W** [americas.theiet.org](http://americas.theiet.org)

@TheIET      

[theiet.org](http://theiet.org)

The Institution of Engineering and Technology is registered as a Charity in England and Wales (No. 211014) and Scotland (No. SC038698). Futures Place, Kings Way, Stevenage, Hertfordshire, SG1 2UA, United Kingdom.

\*A subsidiary of IET Services Ltd.