The Engineering Council

This engineering lens has been developed by Vitae and the Engineering Council.

The Engineering Council is the UK regulatory body for the engineering profession, responsible for setting and maintaining internationally recognised standards of professional competence and ethics, and holding the Registers of professionally qualified engineers and technologists.

Licences are granted by the Engineering Council to discipline-specific professional engineering institutions, allowing them to assess candidates for inclusion on its register of professional engineers and technicians, and to accredit academic programmes and professional development schemes. To gain CEng status, you must be a member of a licensed professional engineering institution, who will act as the awarding body for your registration.

For further information about the Engineering Council see www.engc.org.uk

Information about CEng registration is available see www.engc.org.uk/ceng

UK-SPEC for Chartered Engineer

Chartered Engineers are characterised by their ability to develop appropriate solutions to engineering problems, using new or existing technologies, through innovation, creativity and change. This might involve developing and applying new technologies, promoting advanced design and design methods, introducing new and more efficient production techniques, marketing and construction concepts, or pioneering new engineering services and management methods.

There are five headline competence and commitment standards for Chartered Engineers:

- Use a combination of general and specialist engineering knowledge and understanding to optimise the application of existing and emerging technology
- Apply appropriate theoretical and practical methods to the analysis and solution of engineering problems
- Provide technical and commercial leadership
- Demonstrate effective interpersonal skills
- Demonstrate a personal commitment to professional standards, recognising obligations to society, the profession and the environment

Each is further explained with exemplar activities at:

www.engc.org.uk/ukspec

"The RDF 'engineering lens' will be a very useful tool. It will certainly be of interest to both researchers and potential employers in understanding the set of skills and competencies of professional engineers."

Daniela Bultoc
Skills Development Programme Manager, Graduate School, University College London

To protect and maintain the integrity of the Vitae Researcher Development Framework and the Researcher Development Statement (RDS)[2] and to ensure a consistent approach to the development of lenses on the RDF, anyone wishing to create a lens on the RDF should seek permission from Vitae, and must adhere to the RDF Conditions of Use[3]. Enquiries regarding the development of a lens on the RDF can be directed to: rdf@vitae.ac.uk

For further information about the range of Vitae activities go to www.vitae.ac.uk or contact website@vitae.ac.uk

Vitae is supported by Research Councils UK (RCUK), managed by CRAC: The Career Development Organisation and delivered in partnership with regional Hub host universities

[2] www.vitae.ac.uk/rds
[3] www.vitae.ac.uk/rdfconditionsofuse

Engineering Council

vitae realising the potential of researchers | Researcher Development Framework

Engineering lens on the Vitae Researcher Development Framework and the Engineering Council's UK Standard for Professional Engineering Competence

DRAFT

Overview

The Vitae Researcher Development Framework (RDF) underpins a major new approach to developing world-class researchers. The framework has been developed by and for researchers working in higher education as an aid to planning, promoting and enhancing professional and career development. It articulates the knowledge, behaviours and attributes of successful researchers and encourages all researchers to realise their potential.

This is one of a series of lenses on the Vitae Researcher Development Framework.

For further information about the Vitae Researcher Development Framework visit www.vitae.ac.uk/rdf

For further information about the UK Standard for Professional Engineering Competence (UK-SPEC) published by the Engineering Council visit www.engc.org.uk/ukspec

Supporting materials relating to this lens are available at www.vitae.ac.uk/rdflenses

What is this lens?

This lens is for researchers in engineering and technology who aspire to achieve Chartered Engineer (CEng) status. It provides a bridge between the Vitae Researcher Development Framework and the competence and commitment standard for CEng status that is set out in UK-SPEC[1], published by the Engineering Council.

The CEng title is awarded to those who can demonstrate the requirements published in UK-SPEC, and the assessment process includes a review of submitted documentary evidence. Evidence can be derived from a range of sources, for example research, managing research contracts, industry-related activity, taught modules and public engagement. This lens demonstrates the strong link between the UK-SPEC requirements for CEng and the development of an engineering researcher's knowledge, understanding, skills, competence and attributes. It is intended to help researchers to make these links and assist them in identifying elements of their research activity that could demonstrate CEng competence. It can also be used as a professional development tool/planner to identify further areas of development. Gathering evidence around Phases 2 and 3 in the RDF will help in demonstrating CEng competence.

Why become registered as a Chartered Engineer?

Having CEng after your name carries considerable prestige. It demonstrates that you have achieved the high standards of competence and commitment that are required for this internationally recognised professional title. It sets you out as a key player in the world of engineering and technology, makes your skills more marketable in an international environment and commands respect from industry.

How to become registered?

If you don't already belong to a professional engineering institution, then joining one is the first step on the way to achieving CEng status. A list of engineering institutions that are licensed to assess candidates for registration is available at www.engc.org.uk

Institutions are usually able to put you in touch with a mentor who will support you through the registration process. You need to plan and document the development of your skills and competence for CEng. The lens over the page will help you to make the link between what you do as a researcher and the UK-SPEC standard for CEng registration.

[1] UK-SPEC is available to download: www.engc.org.uk/ukspec

Engineering lens on the Vitae Researcher Development Framework

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C2 – Plan, budget, organise, direct and control tasks, people and resources
C3 – Lead teams and develop staff to meet changing technical and managerial needs
D3 – Demonstrate personal and social skills An exemplar might be: Apply diversity and anti-discrimination legislation

A1 – Maintain and extend a sound theoretical approach in enabling the introduction and exploitation of new and advancing technology and other developments
B1 – Identify potential projects and opportunities
B2 – Conduct appropriate research and undertake design and development of engineering solutions
B3 – Implement design solutions and evaluate their effectiveness

D1 – Communicate in English with others at all levels
D2 – Present and discuss proposals

A2 – Engage in the creative and innovative development of engineering technology and continuous improvement systems
B1 – Identify potential projects and opportunities
B2 – Conduct appropriate research, and undertake design and development of engineering solutions
B3 – Implement design solutions, and evaluate their effectiveness
C4 – Bring about continuous improvement through quality management

B1 – Identify potential projects and opportunities
D1 – Communicate in English with others at all levels
D2 – Present and discuss proposals
E3 – Undertake engineering activities in a way that contributes to sustainable development

A2 – Engage in the creative and innovative development of engineering technology and continuous improvement systems
B1 – Identify potential projects and opportunities
B2 – Conduct appropriate research and undertake design and development of engineering solutions
B3 – Implement design solutions and evaluate their effectiveness
D2 – Present and discuss proposals

E1 – Comply with relevant codes of conduct
E2 – Manage and apply safe systems of work
E3 – Undertake engineering activities in a way that contributes to sustainable development

C2 – Plan, budget, organise, direct and control tasks, people and resources
C3 – Lead teams and develop staff to meet changing technical and managerial needs
D3 – Demonstrate personal and social skills
E4 – Carry out continuing professional development necessary to maintain and enhance competence in own area of practice

B1 – Identify potential projects and opportunities
B2 – Conduct appropriate research, and undertake design and development of engineering solutions
C1 – Plan for effective project implementation
C2 – Plan, budget, organise, direct and control tasks, people and resources
E2 – Manage and apply safe systems of work

C1 – Plan for effective project implementation
C2 – Plan, budget, organise, direct and control tasks, people and resources
C3 – Lead teams and develop staff to meet changing technical and managerial needs
C4 – Bring about continuous improvement through quality management

C1 – Plan for effective project implementation
C2 – Plan, budget, organise, direct and control tasks, people and resources

B1 – Identify potential projects and opportunities
D3 – Demonstrate personal and social skills
E4 – Carry out continuing professional development necessary to maintain and enhance competence in own area of practice

Collegiality
Team working (C2/C3)
People management
Supervision
Mentoring
Influence and leadership (C2/C3)
Collaboration
Equality and diversity (D3)

Subject knowledge (A1)
Research methods – theoretical knowledge (A1/B2)
Information seeking (B2/B3)
Information literacy and management (B2)
Languages
Academic literacy and numeracy

Communication methods (D1/D2)
Communication media (D1/D2)
Publication (D2)

Analysing (A2/B2)
Synthesising (A2/B1)
Critical thinking (B2)
Evaluating (B3/C4)
Problem solving (A2/B3)

Teaching (D1)
Public engagement (D2)
Enterprise (B1)
Policy
Society and culture (E3)
Global citizenship

Inquiring mind (A2/B3)
Intellectual insight (A2/B1)
Innovation (A2/B2)
Argument construction (B2/D2)
Intellectual risk

Health and safety (E1/E2)
Ethics and principles and sustainability (E1/ E3)
Legal requirements
IPR and copyright (E1)
Respect and confidentiality
Attribution and co-authorship
Appropriate practice (E1)

Enthusiasm
Perseverance
Integrity (D3)
Self-confidence (D3)
Self-reflection (E4)
Responsibility (C2/C3)

Research strategy (B1/B2)
Project planning and delivery (C1/C2)
Risk management (E2)

Preparation and prioritisation (C1/C3)
Commitment to research E4
Time management (C2)
Responsiveness to change (C4)
Work-life balance

Income and funding generation
Financial management (C1/C2)
Infrastructure and resources (C1/C2)

Career management
Continuing professional development (E4)
Responsiveness to opportunities (B1)
Networking (D3)
Reputation and esteem

Domain D
Engagement, influence and impact
The knowledge and skills to work with others and ensure the wider impact of research.

Domain A
Knowledge and intellectual abilities
The knowledge, intellectual abilities and techniques to do research.

Domain C
Research governance and organisation
The knowledge of the standards, requirements and professionalism to do research.

Domain B
Personal effectiveness
The personal qualities and approach to be an effective researcher.

Working with others (D1)
Communication and dissemination (D2)
Engagement and impact (D3)
Knowledge base (A1)
Cognitive abilities (A2)
Creativity (A3)
Professional conduct (C1)
Research management (C2)
Finance, funding and resources (C3)
Personal qualities (B1)
Self-management (B2)
Professional and career development (B3)

Key RDF descriptors that relate to the UK-SPEC competence and commitment standard for CEng are denoted in **bold in the outer circle**.
The UK-SPEC standard for the descriptor is denoted in **pink (A1, B2 etc)** and listed in the **boxed text**.
Further information about the standard and exemplar activities can be found at www.engc.org.uk/ukspec

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