Institution of Agricultural Engineers
Career Learning Assessment Guide to Competencies

G9 - Engineering Council AHEP Competencies for IEng and CEng

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Career Learning Assessment (CLA) is an alternative means of gaining Engineering Council Registration at either Incorporated Engineer (IEng) or Chartered Engineering (CEng) status. IAgrE encourages those members with a lifelong experience of engineering to apply through this individual route to registration. The aim of the CLA route is to match member's knowledge, skills and experience to the equivalent Bachelors or Master Degree. In the same way, for many students following an undergraduate or post graduate degree, this will be accredited as meeting the required knowledge, skills and understanding, either fully or partially. It is worth checking if your qualification already meets these standards – many do. This guidance uses the Engineering Council guidance on The ***Accreditation of Higher Education Programmes (AHEP) 4th Edition*** to show the know-how necessary for CLA candidates submitting an application for IAgrE assessment. The full guidance document is available at https://www.engc.org.uk/ahep.

Science and mathematics

The study of engineering requires a substantial grounding in engineering principles, science and mathematics commensurate with the level of study.

For Career Learning Assessment at ***Incorporated Engineer*** (IEng), which equates to Bachelor's Degree standard, candidates will need to demonstrate:	For Career Learning Assessment at ***Chartered Engineer*** (CEng), which equates to Master's Degree standard or above, candidates will need to demonstrate:
Science, mathematics and engineering principles • Apply knowledge of mathematics, statistics, natural science and engineering principles to broadly-defined problems. Some of the knowledge will be informed by current developments in the subject of study.	**Science, mathematics and engineering principles** • Apply a comprehensive knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Much of the knowledge will be at the forefront of the particular subject of study and informed by a critical awareness of new developments and the wider context of engineering.

Engineering analysis

Engineering analysis involves the application of engineering concepts and tools to analyse, model and solve problems. At higher levels of study engineers will work with information that may be uncertain or incomplete

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Problem analysis • Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles. **Analytical tools and techniques** • Select and apply appropriate computational and analytical techniques to model broadly-defined problems, recognising the limitations of the techniques employed. **Technical literature** • Select and evaluate technical literature and other sources of information to address broadly-defined problems.	**Problem analysis** • Formulate and analyse complex problems to reach substantiated conclusions. This will involve evaluating available data using first principles of mathematics, statistics, natural science and engineering principles, and using engineering judgment to work with information that may be uncertain or incomplete, discussing the limitations of the techniques employed. **Analytical tools and techniques** • Select and apply appropriate computational and analytical techniques to model complex problems, discussing the limitations of the techniques employed. **Technical literature** • Select and critically evaluate technical literature and other sources of information to solve complex problems.

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.

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Design • Design solutions for broadly-defined problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards. **Integrated/systems approach** • Apply an integrated or systems approach to the solution of broadly-defined problems.	**Design** • Design solutions for complex problems that evidence some originality and meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards. **Integrated/systems approach** • Apply an integrated or systems approach to the solution of complex problems.

The Engineer and Society

Engineering activity can have a significant societal impact and engineers must operate in a responsible and ethical manner, recognise the importance of diversity, and help ensure that the benefits of innovation and progress are shared equitably and do not compromise the natural environment or deplete natural resources to the detriment of future generations.

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Sustainability • Evaluate the environmental and societal impact of solutions to broadly-defined problems. **Ethics** • Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct. **Risk** • Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity. **Security** • Adopt a holistic and proportionate approach to the mitigation of security risks. **Equality, diversity and inclusion** • Recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.	**Sustainability** • Evaluate the environmental and societal impact of solutions to complex problems (to include the entire lifecycle of a product or process) and minimise adverse impacts. **Ethics** • Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct. **Risk** • Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity. **Security** • Adopt a holistic and proportionate approach to the mitigation of security risks. **Equality, diversity and inclusion** • Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion.

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.

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Practical and workshop skills • Use practical laboratory and workshop skills to investigate broadly-defined problems. **Materials, equipment, technologies and processes** • Select and apply appropriate materials, equipment, engineering technologies and processes. **Quality management** • Recognise the need for quality management systems and continuous improvement in the context of broadly defined problems. **Engineering and project management** • Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters.	**Practical and workshop skills** • Use practical laboratory and workshop skills to investigate complex problems. **Materials, equipment, technologies and processes** • Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations. **Quality management** • Discuss the role of quality management systems and continuous improvement in the context of complex problems. **Engineering and project management** • Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights Cont'd

Teamwork • Function effectively as an individual, and as a member or leader of a team. **Communication** • Communicate effectively with technical and non-technical audiences. **Lifelong learning** • Plan and record self-learning and development as the foundation for lifelong learning/CPD	**Teamwork** • Function effectively as an individual, and as a member or leader of a team. Evaluate effectiveness of own and team performance **Communication** • Communicate effectively on complex engineering matters with technical and non-technical audiences, evaluating the effectiveness of the methods used. **Lifelong learning** • Plan and record self-learning and development as the foundation for lifelong learning/CPD