

IEng: Broadly-defined problems involve a variety of factors which may impose conflicting constraints, but can be solved by the application of engineering science and well-proven analysis techniques.

CEng: Complex problems have no obvious solution and may involve wide-ranging or conflicting technical issues and/or user needs that can be addressed through creativity and the resourceful application of engineering science.

Area of learning	IEng	CEng
Science and mathematics		
The study of engineering requires a substantial grounding in engineering principles, science and mathematics commensurate with the level of study.		
Science, mathematics and engineering principles	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.	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.		
Problem analysis	Analyse broadly-defined problems reaching substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles.	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 judgement 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 broadly-defined problems, recognising the limitations of the techniques employed.	Select and apply appropriate computational and analytical techniques to model complex problems, discussing the limitations of the techniques employed.
Technical literature	Select and evaluate technical literature and other sources of information to address complex problems.	Select and critically evaluate technical literature and other sources of information to solve complex problems.
Design		
Design is the creation and development of an economically viable product, process or system to meet a defined need. It involves significant technical and intellectual challenges commensurate with the level of study.		

Design	Design solutions for complex problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.	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 broadly-defined problems.	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.		
Sustainability	Evaluate the environmental and societal impact of solutions to broadly-defined problems.	Evaluate the environmental and societal impact of solutions to complex problems (to include the entire life-cycle of a product or process) and minimise adverse impacts.
Ethics	Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.	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.	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.	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.	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.		
Practical and workshop skills	Use practical laboratory and workshop skills to investigate broadly-defined problems.	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.	Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations.

Quality management	Recognise the need for quality management systems and continuous improvement in the context of broadly-defined problems.	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 management and relevant legal matters.	Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.
Teamwork	Function effectively as an individual, and as a member or leader of a team.	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.	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.	Plan and record self-learning and development as the foundation for lifelong learning/CPD.