

Bachelors and Integrated Master's Degree Learning Outcomes – Institution of Engineering Designers Contextualisation

For all Institution of Engineering Designers Engineering Council accredited degrees, the weighting given to the six broad areas of learning will vary according to the nature and aims of each programme. Typically, an Institution of Engineering Designers Engineering Council accredited programme is characterised by the depth of education offered in Engineering Design and, more particularly, the knowledge and application which distinguishes Engineering Design as a profession.

Bachelors degrees and Bachelors (Honours) degrees accredited for the purpose of IEng registration will have an emphasis on development and attainment of the know-how necessary to apply technology to engineering design problems and processes, and to maintain and manage current technology, sometimes within a multidisciplinary engineering environment. Graduates from accredited Bachelors or Bachelors (Honours) degree programmes must achieve the learning outcomes described below. The breadth and depth of underpinning scientific and mathematical knowledge, understanding and skills will be provided in the most appropriate manner to enable the application of engineering principles within existing technology to future engineering problems and processes. Graduates are likely to have acquired some of this ability through involvement in individual and/or group design projects. Programmes will develop a knowledge and understanding of current engineering practice and processes, with less focus on analysis than in programmes accredited for CEng. Design will be a significant component, especially in integrating a range of knowledge and understanding to design products, systems and processes to meet defined needs using current technology.

Bachelors (Honours) degrees accredited as partially meeting the educational requirement for CEng develop the ability to apply a thorough understanding of relevant science and mathematics to the analysis and design of technical solutions to improve quality of life. Graduates from accredited Bachelors (Honours) programmes must achieve a systematic understanding of the learning outcomes described below, including acquisition of coherent and detailed knowledge, much of which is at, or informed by, the forefront of defined aspects of the relevant engineering discipline. Crucially, they will have the ability to integrate their knowledge and understanding of mathematics; science; computer-based methods; design; the economic, legal, social, ethical and environmental context; and engineering practice to solve problems, some of a complex nature, in their chosen engineering design discipline. They are likely to have acquired some of this ability through involvement in individual and/or group design projects.

Integrated Masters (MEng) degrees accredited for CEng registration include the outcomes of accredited Bachelors (Honours) degrees and go beyond to provide a greater range and depth of specialist knowledge, within a research and industrial environment, as well as a broader and more general academic base. Such programmes should provide both a foundation for leadership and a wider appreciation of the economic, legal, social, ethical and environmental context of engineering. Graduates from an accredited integrated Masters (MEng) degree must achieve a systematic understanding of the learning outcomes described below, including acquisition of coherent and detailed knowledge, most of which is at, or informed by, the forefront of defined aspects of the engineering design discipline. Some of the learning outcomes will be to levels deeper and broader than in a Bachelors programme, the balance of which will vary according to the nature and aims of each programme. Crucially, graduates will have the ability to integrate their knowledge and understanding of mathematics; science; computer-based methods; design; the economic, legal, social, ethical and environmental context; and engineering practice to solve a

substantial range of engineering problems, some of them complex or novel. They will have acquired much of this ability through involvement in individual and group design projects. Ideally some of these projects would have industrial involvement or be practice-based.

Masters degrees (other than the integrated Masters) accredited as further learning to Masters level, partially meeting the educational requirement for CEng vary in nature and purpose. Some offer the chance to study in greater depth particular aspects or applications of a broader discipline in which the graduate holds an Honours degree at Bachelors level. Others bring together different engineering disciplines or sub-disciplines in the study of a particular topic, or engineering application, while a further category may be truly multidisciplinary.

Masters programmes also provide an opportunity to integrate the technical and non-technical aspects of engineering and to develop a commitment to professional and social responsibility and ethical codes.

Graduates from an accredited Masters degree must achieve a systematic understanding of the learning outcomes, including acquisition of coherent and detailed knowledge, most of which is at, or informed by, the forefront of defined aspects of the relevant engineering discipline. Some of the learning outcomes will be to enhanced and extended levels, the balance of which will vary according to the nature and aims of each programme. Crucially, graduates will have the ability to integrate their prior knowledge and understanding of the discipline and engineering practice with the development of advanced level knowledge and understanding, to solve a substantial range of engineering design problems, some of them complex or novel. They will have acquired much of this ability through individual and/or group projects. Ideally some of these projects would have industrial involvement or be practice-based.