

The (IET) codes have been allocated to learning outcomes as follows:

SM	Science and Mathematics
EA	Engineering Analysis
D	Design
ET	Economic, Legal, Social, Ethical and Environmental Context
EP	Engineering Practice

Postfix 'p' Indicates that the learning outcome is for partial CEng accreditation. Usually for BEng programmes

Postfix 'm' Indicates that the learning outcome is for full CEng accreditation. Usually for Integrated Masters (MEng) programmes.

Postfix 'fl' Indicates that the learning outcomes is for partial CEng further learning accreditation. Usually for MSc or equivalent Masters programmes

Accreditation of HE Programmes (AHEP): Collated learning outcomes for six areas of learning (programmes accredited for CEng)

Science and Mathematics (SM)

Programmes accredited for CEng

Bachelors (Honours) Degrees accredited as partly meeting the educational requirement for CEng (Further learning to Masters level will be required)	Code	Integrated Masters (MEng) Degrees	Code	Masters Degrees ¹ other than the Integrated Masters (MEng) (Accredited as further learning to Masters level, partly meeting the educational requirement for CEng)	Code
Engineering is underpinned by science and mathematics, and other associated disciplines, as defined by the relevant professional engineering institution(s). Graduates will need the following knowledge, understanding and abilities:		Engineering is underpinned by science and mathematics, and other associated disciplines, as defined by the relevant professional engineering institution(s). Graduates will need the following knowledge, understanding and abilities:		Engineering is underpinned by science and mathematics, and other associated disciplines, as defined by the relevant professional engineering institution(s). The main science and mathematical abilities will have been developed in an accredited engineering undergraduate programme. Masters graduates will therefore need additionally:	
Knowledge and understanding of scientific principles and methodology necessary to underpin their education in their engineering discipline, to enable appreciation of its scientific and engineering context, and to support their understanding of relevant historical, current and future developments and technologies	SM1p	A comprehensive knowledge and understanding of scientific principles and methodology necessary to underpin their education in their engineering discipline, and an understanding and know-how of the scientific principles of related disciplines, to enable appreciation of the scientific and engineering context, and to support their understanding of relevant historical, current and future developments and technologies	SM1m	A comprehensive understanding of the relevant scientific principles of the specialisation	SM1fl
Knowledge and understanding of mathematical and statistical methods necessary to underpin their education in their engineering discipline and to enable them to apply mathematical and statistical methods, tools and notations proficiently in the analysis and solution of engineering problems	SM2p	Knowledge and understanding of mathematical and statistical methods necessary to underpin their education in their engineering discipline and to enable them to apply a range of mathematical and statistical methods, tools and notations proficiently and critically in the analysis and solution of engineering problems	SM2m		
Ability to apply and integrate knowledge and understanding of other engineering disciplines to support study of their own engineering discipline	SM3p	Ability to apply and integrate knowledge and understanding of other engineering disciplines to support study of their own engineering discipline and the ability to evaluate them critically and to apply them effectively	SM3m		

		Awareness of developing technologies related to own specialisation	SM4m	A critical awareness of current problems and/or new insights most of which is at, or informed by, the forefront of the specialisation	SM2fl
		A comprehensive knowledge and understanding of mathematical and computational models relevant to the engineering discipline, and an appreciation of their limitations	SM5m		
		Understanding of concepts from a range of areas including some outside engineering, and the ability to evaluate them critically and to apply them effectively in engineering projects	SM6m	Understanding of concepts relevant to the discipline, some from outside engineering, and the ability to evaluate them critically and to apply them effectively, including in engineering projects	SM3fl

Engineering Analysis (EA)

Programmes accredited for CEng

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Engineering analysis involves the application of engineering concepts and tools to the solution of engineering problems. Graduates will need:		Engineering analysis involves the application of engineering concepts and tools to the solution of engineering problems. Graduates will need:		Engineering analysis involves the application of engineering concepts and tools to the solution of engineering problems. The main engineering analysis abilities will have been developed in an accredited engineering undergraduate programme. Masters graduates will therefore need additionally:	
Understanding of engineering principles and the ability to apply them to analyse key engineering processes	EA1p	Understanding of engineering principles and the ability to apply them to undertake critical analysis of key engineering processes	EA1m		
Ability to identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques	EA2p	Ability to identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques	EA2m		
Ability to apply quantitative and computational methods in order to solve engineering problems and to implement appropriate action	EA3p	Ability to apply quantitative and computational methods, using alternative approaches and understanding their limitations, in order to solve engineering problems and to implement appropriate action	EA3m	Ability both to apply appropriate engineering analysis methods for solving complex problems in engineering and to assess their limitations	EA1fl
Understanding of, and the ability to apply, an integrated or systems approach to solving engineering problems	EA4p	Understanding of, and the ability to apply, an integrated or systems approach to solving complex engineering problems	EA4m		
		Ability to use fundamental knowledge to investigate new and emerging technologies	EA5m	Ability to use fundamental knowledge to investigate new and emerging technologies	EA2fl

		Ability to extract and evaluate pertinent data and to apply engineering analysis techniques in the solution of unfamiliar problems	EA6m	Ability to collect and analyse research data and to use appropriate engineering analysis tools in tackling unfamiliar problems, such as those with uncertain or incomplete data or specifications, by the appropriate innovation, use or adaptation of engineering analytical methods	EA3fl
Design (D)					
Programmes accredited for CEng					
Bachelors (Honours) Degrees accredited as partly meeting the educational requirement for CEng (Further learning to Masters level will be required)	Code	Integrated Masters (MEng) Degrees	Code	Masters Degrees¹ other than the Integrated Masters (MEng) (Accredited as further learning to Masters level, partly meeting the educational requirement for CEng)	Code
Design at this level 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 and can be used to integrate all engineering understanding, knowledge and skills to the solution of real and complex problems. Graduates will therefore need the knowledge, understanding and skills to:		Design at this level 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 and can be used to integrate all engineering understanding, knowledge and skills to the solution of real and complex problems. Graduates will therefore need the knowledge, understanding and skills to:		Design at this level 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 and can be used to integrate all engineering understanding, knowledge and skills to the solution of real and complex problems. The main design abilities will have been developed in an accredited engineering undergraduate programme. Masters graduates will need additionally:	
Understand and evaluate business, customer and user needs, including considerations such as the wider engineering context, public perception and aesthetics	D1p	Understand and evaluate business, customer and user needs, including considerations such as the wider engineering context, public perception and aesthetics	D1m		
Investigate and define the problem, identifying any constraints including environmental and sustainability limitations; ethical, health, safety, security and risk issues; intellectual property; codes of practice and standards	D2p	Investigate and define the problem, identifying any constraints including environmental and sustainability limitations; ethical, health, safety, security and risk issues; intellectual property; codes of practice and standards	D2m		
Work with information that may be incomplete or uncertain and quantify the effect of this on the design	D3p	Work with information that may be incomplete or uncertain, quantify the effect of this on the design and, where appropriate, use theory or experimental research to mitigate deficiencies	D3m	Knowledge, understanding and skills to work with information that may be incomplete or uncertain, quantify the effect of this on the design and, where appropriate, use theory or experimental research to mitigate deficiencies	D1fl
Apply advanced problem-solving skills, technical knowledge and understanding, to establish rigorous and creative solutions that are fit for purpose for all aspects of the problem including production, operation, maintenance and disposal	D4p	Apply advanced problem-solving skills, technical knowledge and understanding, to establish rigorous and creative solutions that are fit for purpose for all aspects of the problem including production, operation, maintenance and disposal	D4m		
Plan and manage the design process, including cost drivers, and evaluate outcomes	D5p	Plan and manage the design process, including cost drivers, and evaluate outcomes	D5m		
Communicate their work to technical and non- technical audiences	D6p	Communicate their work to technical and non- technical audiences	D6m		

		Demonstrate wide knowledge and comprehensive understanding of design processes and methodologies and the ability to apply and adapt them in unfamiliar situations	D7m	Knowledge and comprehensive understanding of design processes and methodologies and the ability to apply and adapt them in unfamiliar situations	D2fl
		Demonstrate the ability to generate an innovative design for products, systems, components or processes to fulfil new needs	D8m	Ability to generate an innovative design for products, systems, components or processes to fulfil new needs	D3fl

Economic, legal, social, ethical and environmental context (ET)

Programmes accredited for CEng

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Engineering activity can have impacts on the environment, on commerce, on society and on individuals. Graduates therefore need the skills to manage their activities and to be aware of the various legal and ethical constraints under which they are expected to operate, including:		Engineering activity can have impacts on the environment, on commerce, on society and on individuals. Graduates therefore need the skills to manage their activities and to be aware of the various legal and ethical constraints under which they are expected to operate, including:		Engineering activity can have impacts on the environment, on commerce, on society and on individuals. Graduates therefore need the skills to manage their activities and to be aware of the various legal and ethical constraints under which they are expected to operate, including:	
Understanding of the need for a high level of professional and ethical conduct in engineering and a knowledge of professional codes of conduct	ET1p	Understanding of the need for a high level of professional and ethical conduct in engineering, a knowledge of professional codes of conduct and how ethical dilemmas can arise	ET1m	Awareness of the need for a high level of professional and ethical conduct in engineering	ET1fl
Knowledge and understanding of the commercial, economic and social context of engineering processes	ET2p	Knowledge and understanding of the commercial, economic and social context of engineering processes	ET2m	Awareness that engineers need to take account of the commercial and social contexts in which they operate	ET2fl
Knowledge and understanding of management techniques, including project management, that may be used to achieve engineering objectives	ET3p	Knowledge and understanding of management techniques, including project and change management that may be used to achieve engineering objectives, their limitations and how they may be applied appropriately	ET3m	Knowledge and understanding of management and business practices, their limitations, and how these may be applied in the context of the particular specialisation	ET3fl
Understanding of the requirement for engineering activities to promote sustainable development and ability to apply quantitative techniques where appropriate	ET4p	Understanding of the requirement for engineering activities to promote sustainable development and ability to apply quantitative techniques where appropriate	ET4m	Awareness that engineering activities should promote sustainable development and ability to apply quantitative techniques where appropriate	ET4fl
Awareness of relevant legal requirements governing engineering activities, including personnel, health & safety, contracts, intellectual property rights, product safety and liability issues	ET5p	Awareness of relevant legal requirements governing engineering activities, including personnel, health & safety, contracts, intellectual property rights, product safety and liability issues, and an awareness that these may differ internationally	ET5m	Awareness of relevant regulatory requirements governing engineering activities in the context of the particular specialisation	ET5fl
Knowledge and understanding of risk issues, including health & safety, environmental and commercial risk, and of risk assessment and risk management techniques	ET6p	Knowledge and understanding of risk issues, including health & safety, environmental and commercial risk, risk assessment and risk management techniques and an ability to evaluate commercial risk	ET6m	Awareness of and ability to make general evaluations of risk issues in the context of the particular specialisation, including health & safety, environmental and commercial risk	ET6fl
		Understanding of the key drivers for business success, including innovation, calculated commercial risks and customer satisfaction	ET7m		

Engineering practice (EP)

Programmes accredited for CEng

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This is the practical application of engineering skills, combining theory and experience, and use of other relevant knowledge and skills. This can include:		This is the practical application of engineering skills, combining theory and experience, and use of other relevant knowledge and skills. This can include:		The main engineering practice abilities will have been developed in an accredited engineering undergraduate programme. Masters graduates will need to demonstrate application of these abilities where appropriate and additional engineering skills which can include:	
Understanding of contexts in which engineering knowledge can be applied (eg operations and management, application and development of technology, etc)	EP1p	Understanding of contexts in which engineering knowledge can be applied (eg operations and management, application and development of technology, etc)	EP1m		
Knowledge of characteristics of particular materials, equipment, processes, or products	EP2p	Knowledge of characteristics of particular equipment, processes, or products, with extensive knowledge and understanding of a wide range of engineering materials and components	EP2m	Advanced level knowledge and understanding of a wide range of engineering materials and components	EP1fl
Ability to apply relevant practical and laboratory skills	EP3p	Ability to apply relevant practical and laboratory skills	EP3m		
Understanding of the use of technical literature and other information sources	EP4p	Understanding of the use of technical literature and other information sources	EP4m		
Knowledge of relevant legal and contractual issues	EP5p	Knowledge of relevant legal and contractual issues	EP5m		
Understanding of appropriate codes of practice and industry standards	EP6p	Understanding of appropriate codes of practice and industry standards	EP6m		
Awareness of quality issues and their application to continuous improvement	EP7p	Awareness of quality issues and their application to continuous improvement	EP7m		
Ability to work with technical uncertainty	EP8p	Ability to work with technical uncertainty	EP8m		
		A thorough understanding of current practice and its limitations, and some appreciation of likely new developments	EP9m	A thorough understanding of current practice and its limitations, and some appreciation of likely new developments	EP2fl
		Ability to apply engineering techniques taking account of a range of commercial and industrial constraints	EP10m	Ability to apply engineering techniques taking account of a range of commercial and industrial constraints	EP3fl
Understanding of, and the ability to work in different roles within an engineering team	EP9p	Understanding of different roles within an engineering team and the ability to exercise initiative and personal responsibility, which may be as a team member or leader	EP11m	Understanding of different roles within an engineering team and the ability to exercise initiative and personal responsibility, which may be as a team member or leader	EP4fl

Additional general skills (G)

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Graduates must have developed transferable skills, additional to those set out in the other learning outcomes, that will be of value in a wide range of situations, including the ability to:		Graduates must have developed transferable skills, additional to those set out in the other learning outcomes, that will be of value in a wide range of situations, including the ability to:		Graduates must have developed transferable skills, additional to those set out in the other learning outcomes, that will be of value in a wide range of situations, including the ability to:	
Apply their skills in problem solving, communication, working with others, information retrieval, and the effective use of general IT facilities	G1p	Apply their skills in problem solving, communication, working with others, information retrieval and the effective use of general IT facilities	G1m	Apply their skills in problem solving, communication, information retrieval, working with others, and the effective use of general IT facilities	G1fl
Plan self-learning and improve performance, as the foundation for lifelong learning/CPD	G2p	Plan self-learning and improve performance, as the foundation for lifelong learning/CPD	G2m	Plan self-learning and improve performance, as the foundation for lifelong learning/CPD	G2fl
Plan and carry out a personal programme of work, adjusting where appropriate	G3p	Monitor and adjust a personal programme of work on an on-going basis	G3m	Monitor and adjust a personal programme of work on an on-going basis	G3fl
Exercise initiative and personal responsibility, which may be as a team member or leader	G4p	Exercise initiative and personal responsibility, which may be as a team member or leader	G4m	Exercise initiative and personal responsibility, which may be as a team member or leader	G4fl