Institution of MECHANICAL ENGINEERS

Improving the world through engineering

REVIEW OF QUALIFICATIONS GUIDANCE

These guidance notes are intended to complement the Academic Assessment Form by providing information that you should consider before completing your form.

Please contact the Membership Helpdesk to identify if completion of the form is necessary or alternatively, submit the Qualification Checker.

If your qualification is not accredited, or you have no formal qualifications the Academic Assessment Committee (AAC) can assess your academic achievements for either CEng or IEng registration. The AAC can either accept your qualifications as they are or recommend further steps to enable you to meet the criteria.

We would advise you to complete the assessment form as soon as possible in case any additional study is required.

On receipt of the completed application form your qualifications will be assessed against the appropriate benchmark:

Incorporated Engineer – the benchmark is a three year accredited Bachelors degree in engineering or technology (a BEng/BSc degree). This may also be demonstrated by a HND/C or Foundation Degree in engineering or technology plus appropriate further learning to degree level.

Chartered Engineer – the benchmark is an accredited Bachelors degree with honours (BEng(Hons)) plus an appropriate Masters degree accredited or approved by a professional engineering institution or appropriate further learning to Masters level. This may also be demonstrated by an accredited integrated MEng degree.

When making a final decision, the committee will take into account the content of your course(s) and any additional training/study that you have completed since graduation, whether this is in the form of formal study, or work-based-learning. Therefore, **it is essential that you submit a detailed CV with your form** which clearly shows what you have done in your work that could be considered as further learning, for example, any courses that you have attended. You should also include a description of your current job role.

All applicants who apply for assessment of their qualifications will be considered against current criteria. You will be advised whether any further study is required, or if you are invited to submit a Technical Report to demonstrate your knowledge and understanding of engineering

principles as required by the **IMechE's Educational Base**, an extract of this is given in **Appendix 1**.

If you require any additional assistance when completing the Assessment of Qualifications form please contact the Membership Helpdesk on 0845 226 9191 from the UK or +44(0)20 7304 6999 from overseas. Alternatively, you can contact the Helpdesk by email: membership@imeche.org

Appendix 1 – Extracts from IMechE Educational Base

The Engineering Council UK has defined both general and specific learning outcomes required of educational programmes providing the base for registration. These have been intrepreted by the IMechE and incorporated into its Educational Base. The following extracts from the IMechE's Educational Base set the overall context and specific details for the Learning Outcomes from engineering degree programmes fulfilling the requirements for registration as Incorporated and Chartered Engineers and may be used as guidance when determining what information is required on the self assessment form. The information supplied on the Academic Assessment form will be assessed against these General and Specific Learning Outcomes. **This information is supplied in order to assist those completing the forms, ensuring that they have access to all relevant information (including the assessment criteria) in a transparent manner.**

Section 1. Context for the Learning Outcomes from an IMechE accredited degree (General Learning Outcomes)

In the table below the central column, related to the BEng (Hons) for CEng, is the reference column and the ones to the left and right show enhancements or limitations to it. Where no enhancements or limitations are shown, the statement in the central column applies. BEng (Hons) courses for CEng will under UKSPEC require Further Learning to Masters Level to meet the criteria for CEng registration. Integrated MEng courses are another option to meet the qualification criteria.

The subject coverage and balance in an IMechE accredited degree is as follows:

IEng degree	BEng(Hons) for CEng	Integrated MEng
Place an emphasis on the application of developed technology and the attainment of know-how, sometimes within a multidisciplinary engineering environment. The breadth and depth of underpinning scientific and mathematical knowledge, understanding and skills is provided in the most appropriate manner to enable the application of engineering principles within existing technology to future engineering problems and processes.	To be accredited, engineering programmes must provide two different categories of learning outcomes. One category will be general in nature, and will apply to all types of programmes. The second category will be more specific. These two categories of outcomes will be inter-related, with the general learning outcomes being embodied to a greater or lesser extend within the various engineering learning outcomes.	MEng degrees differ from CEng Bachelors degrees in having a greater range of project work, including a group project. They also provide a greater range and depth of specialist knowledge within a research and industrial environment, as well as a broader and more general educational base, to provide both a foundation for leadership and a wider appreciation of the economic, social and environmental context of engineering.
A programme accredited for IEng will have the general learning outcomes described earlier in this document.		The range of general learning outcomes described for graduates from Bachelors

IEng programmes will have an emphasis on developing and supporting the know-how necessary to apply technology to engineering problems and processes, and to maintain and manage current technology at peak efficiency.		programmes will also apply to graduates from MEng programmes. Graduates from an accredited, integrated MEng degree will have the ability to integrate their knowledge and understanding of mathematics, science, ICT, design, the economic, social and environmental context and engineering practice to solve a substantial range of engineering problem;, some of a complex nature. They will have acquired much of this ability through involvement in individual and group design projects, which have a greater degree of industrial involvement than those in Bachelors degree programmes.
Knowledge and Understanding		
Underpinning scientific and mathematical knowledge and understanding to enable the application of engineering principles within existing technology to future engineering problems and processes.	Must be able to demonstrate their knowledge and understanding of essential facts, concepts, theories and principles of their engineering discipline, and its underpinning science and mathematics.	The ability to learn new theories, concepts, methods etc in unfamiliar situations.
	Must have an appreciation of the wider multidisciplinary engineering context and its underlying principles.	
	Must appreciate the social, environmental, ethical, economic and commercial considerations affecting the exercise of their engineering judgement.	
Intellectual abilities		
To support know-how when applying technology to future engineering problems and processes.	Must be able to apply appropriate, quantitative science and engineering tools to the analysis of problems.	The ability to develop, monitor and update a plan, to reflect a changing operating environment.
	Must be able to demonstrate creative and innovative ability in the synthesis of solutions and in formulating design.	
	Must be able to comprehend the broad picture and thus work with an appropriate level of detail.	
Practical skills		
Application of engineering principles within existing technology to future engineering problems and processes.	Must possess practical engineering skills acquired through, for example, work carried out in laboratories and workshops, in industry through supervised work experience, in individual and group project work, in design work and in the development and use of computer software in design, analysis and control.	
	Evidence of group working and participation in a major project are expected.	An understanding of different roles within a team, and the ability to exercise leadership.
General transferable		

skills		
	Must have developed transferable skills that will be of value in a wide range of situations.	
	Exemplified by the QCA Higher Level Key Skills and include problem solving, communication, and working with others, as well as the effective use of general IT facilities and information retrieval skills.	
	Also include planning self-learning and improving performance as the foundation for lifelong learning/CPD.	The ability to monitor and adjust a personal programme of work on an ongoing basis, and to learn independently.

Section 2. Specific Learning Outcomes

Graduates from accredited programmes must achieve the following five learning outcomes, defined by broad areas of learning. The learning outcomes are expressed in terms of underpinning science and mathematics, engineering analysis, design, economic, social and environmental context and engineering practice.

"Understanding" is the capacity to use concepts creatively, for example, in problem solving, in design, in explanations and in diagnosis.
"Knowledge" is information that can be recalled.
"Know-how" is the ability to apply learned knowledge and skills to perform operations intuitively, efficiently and correctly.
"Skills" are acquired and learned attributes which can be applied almost automatically.
"Awareness" is general familiarity, albeit bounded by the needs of the specific discipline.

IEng degree as enhancement or limitation to BEng (Hons) for CEng	**BEng (Hons) for CEng**	**Integrated MEng degree as enhancement of BEng Hons**
Underpinning science and mathematics, and associated engineering disciplines (US)		
Knowledge and understanding of the scientific principles underpinning relevant technologies. **US1i**	Knowledge and understanding of scientific principles and methodology necessary to underpin their education in mechanical and related engineering disciplines, to enable appreciation of its scientific and engineering context, and to support their understanding of future developments and technologies. **US1**	A comprehensive understanding of the scientific principles of mechanical and related engineering disciplines. **US1m**
Knowledge and understanding of mathematics necessary to support application of key engineering principles. **US2i**	Knowledge and understanding of mathematical principles necessary to underpin their education in mechanical and related engineering disciplines and to enable them to apply mathematical methods, tools and notations proficiently in the analysis and solution of engineering problems. **US2**	A comprehensive knowledge and understanding of mathematical models relevant to the mechanical and related engineering disciplines, and an appreciation of their limitations. **US2m**
	Ability to apply and integrate knowledge and understanding of other engineering disciplines to support study mechanical and related engineering disciplines. **US3**	An understanding of concepts from a range of areas including some outside engineering, and the ability to apply them effectively in engineering projects. **US3m**
		A comprehensive working knowledge and understanding of the

		role and limitations of ICT, and an awareness of developing technologies in ICT. **US4m**
Engineering Analysis (E)		
Ability to monitor, interpret and apply the results of analyses and modelling in order to bring about continuous improvement. **E1i**	Understanding of engineering principles and the ability to apply them to analyse key engineering processes. **E1**	Ability to use fundamental knowledge to investigate new and emerging technologies. **E1m**
Ability to use the results of analysis to solve engineering problems, apply technology and implement engineering processes. **E2i**	Ability to identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques. **E2**	Ability to use extract data pertinent to an unfamiliar problem, and apply in its solution using computer based engineering tools where appropriate. **E2m**
Ability to apply quantitative methods and computer software relevant to mechanical engineering technology, frequently within a multidisciplinary context. **E3i**	Ability to apply quantitative methods and computer software relevant to mechanical and related engineering disciplines, to solve engineering problems. **E3**	An understanding of the capabilities of computer based models for solving problems in engineering, and the ability to assess the limitations of particular cases. **E3m**
Ability to apply a systems approach to engineering problems through know-how of the application of the relevant technologies. **E4i**	Understanding of and ability to apply a systems approach to engineering problems. **E4**	
Design (D)		
Define a problem and identify constraints. **D1i**	Investigate and define a problem and identify constraints including environmental and sustainability limitations, health and safety and risk assessment issues. **D1**	Wide knowledge and comprehensive understanding of design processes and methodologies and the ability to apply and adapt them in unfamiliar situations. **D1m**
Design solutions according to customer and user needs. **D2i**	Understand customer and user needs and the importance of considerations such as aesthetics. **D2**	
	Identify and manage cost drivers. **D3**	
Use practical creativity and innovation. **D4i**	Use creativity to establish innovative solutions. **D4**	Ability to generate an innovative design for systems, components or processes to fulfil new needs. **D4m**
Ensure fitness for purpose (including operation, maintenance, reliability etc). **D51**	Ensure fitness for purpose for all aspects of the problem including production, operation, maintenance and disposal. **D5**	Ability to generate ideas for new products and develop and evaluate a range of new solutions. **D5m**
Adapt designs to meet their new purposes or applications. **D6i**	Manage the design process and evaluate outcomes. **D6**	
Economic, social and environmental context (S)		
Knowledge and understanding of commercial and economic context of engineering processes. **S1i**	Knowledge and understanding of commercial and economic context of engineering processes. **S1**	The ability to make general evaluations of commercial risks through some understanding of the

		basis of such risks. **S1m**
Knowledge of management techniques which may be used to achieve engineering objectives within that context. **S2i**	Knowledge of management techniques which may be used to achieve engineering objectives within that context. **S2**	Extensive knowledge and understanding of management and business practices, and their limitations, and how these may be applied appropriately to strategic and tactical issues. **S2m**
	Understanding of the requirement for engineering activities to promote sustainable development. **S3**	
	Awareness of the framework of relevant legal requirements governing engineering activities, including personnel, health, safety, and risk (including environmental risk) issues. **S4**	
	Understanding of the need for a high level of professional and ethical conduct in engineering. **S5**	
Engineering Practice (P)		
Understanding of and ability to use relevant equipment, tools, processes, or products. **P1i**	Knowledge of characteristics of particular equipment, processes, or products. **P1**	A thorough understanding of current practices and its limitations, and some appreciation of likely new developments. **P1m**
Knowledge and understanding of engineering workshop and laboratory practice. **P2i**	Engineering workshop and laboratory skills. **P2**	Extensive knowledge and understanding of a wide range of engineering materials and components. **P2m**
Knowledge of contexts in which engineering knowledge can be applied (e.g. operations and management, technology development, technology application etc). **P3i**	Understanding of contexts in which engineering knowledge can be applied (e.g. operations and management, technology development, etc). **P3**	
Ability to use and apply information from technical literature. **P4i**	Understanding use of technical literature and other information sources. **P4**	
	Awareness of nature of intellectual property and contractual issues. **P5**	
Ability to use appropriate codes of practice and industry standards. **P6i**	Understanding of appropriate codes of practice and industry standards. **P6**	
Awareness of quality issues and their application to continuous improvement. **P7i**	Awareness of quality issues. **P7**	
Understanding of the principles of managing engineering processes. **P8i**	Ability to work with technical uncertainty. **P8**	Ability to apply engineering techniques taking account of a range of commercial and industrial constraints. **P8m**