Applicability of Output Standards to Masters degrees other than the integrated MEng

Preamble
Masters degrees[1] accredited for the purposes of registration with the Engineering Council 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. 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 multi-disciplinary. 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.
The key factor in considering Masters degrees for accreditation is that they deliver the learning outcomes, which should be interpreted in the context of the particular discipline. The outcomes are designed to enable programme development and innovation.
Graduates from an accredited Masters degree will have the general and specific learning outcomes described here and will have some of these to enhanced and extended levels.
Crucially, they 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 problems, some of a complex nature. They will have acquired much of this ability through individual and/or group projects. Ideally some of these projects would have included industrial involvement or be practice-based.
General Learning Outcomes The range of general learning outcomes described for graduates from Bachelors programmes will also apply to graduates from Masters degree programmes. In respect of general transferable skills, the following enhanced outcomes should be expected of Masters degree graduates:
■ The ability to develop, monitor and update a plan, to reflect a changing operating environment;
■ The ability to monitor and adjust a personal programme of work on an on-going basis, and to learn independently;
■ The ability to exercise initiative and personal responsibility, which may be as a team member or leader;
■ The ability to learn new theories, concepts, methods etc and apply these in unfamiliar situations.
Specific Learning Outcomes In respect of the specific learning outcomes, Masters degree graduates will also be characterised **by some or all of the following** (the balance will vary according to the nature and aims of each programme): **Underpinning science and mathematics, etc.**

[1] The term 'Masters degree' is used throughout this document to mean an engineering degree at Level 7 (Level 11 in Scotland) other than the integrated Masters degree (MEng)

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■ A comprehensive understanding of the relevant scientific principles of the specialisation
■ A critical awareness of current problems and/or new insights much of which is at, or informed by, the forefront of the specialisation.
■ An understanding of concepts relevant to the discipline, some from outside engineering, and the ability to critically evaluate and apply them effectively.
Engineering Analysis ■ The ability to use fundamental knowledge to investigate new and emerging technologies;
■ The ability to apply appropriate models for solving problems in engineering, and the ability to assess the limitations of particular cases;
■ The ability to collect and analyse research data and use appropriate engineering tools to tackle unfamiliar problems, such as those with uncertain or incomplete data or specifications, by the appropriate innovation, use or adaptation of engineering analytical methods.
Design ■ The ability to apply original thought to the development of practical solutions for products, systems, components or processes.
Economic, social and environmental context ■ Knowledge and understanding of management and business practices, and their limitations, and how these may be applied appropriately, in the context of the particular specialisation;
■ The ability to make general evaluations of risks through some understanding of the basis of such risks.
Engineering Practice ■ A thorough understanding of current practice and its limitations, and some appreciation of likely new developments;
■ Advanced level knowledge and understanding of a wide range of engineering materials and components;
■ The ability to apply engineering techniques taking account of a range of commercial and industrial constraints.