

# EAB

## Engineering Accreditation Board

### Appendix C: Masters Degree Learning Outcomes

The UK-SPEC publication “The Accreditation of Higher Education Programmes” states that there will be two principal reference points for Masters degrees – the QAA qualification descriptor, and the competence statements which accrediting Institutions have adopted under UK-SPEC.

#### QAA Qualification Descriptor for Masters degrees

Masters degrees are awarded to individuals who have demonstrated:

- Q1** a systematic understanding of knowledge, and a critical awareness of current problems and/or new insights much of which is at, or informed by, the forefront of their academic discipline, field of study or area of professional practice;
- Q2** a comprehensive understanding of techniques applicable to their own research or advanced scholarship;
- Q3** originality in application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline;
- Q4** conceptual understanding that enables an individual
  - to evaluate critically current research and advanced scholarship in the discipline; and
  - to evaluate methodologies and develop critiques of them and, where appropriate, to propose new hypotheses.

Applicants will be able to:

- Q5** deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences;
- Q6** demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level;
- Q7** continue to advance their knowledge and understanding, and to develop new skills to a high level.

*and will have* the qualities and transferable skills necessary for employment requiring:

- Q8** the exercise of initiative and personal responsibility;
- Q9** decision-making in complex and unpredictable situations; and
- Q10** the independent learning ability required for continuing professional development.

## **UK-SPEC Threshold statements of competence and commitment**

Chartered Engineers must be competent throughout their working life, by virtue of their education, training and experience, to:

### **A Use a combination of general and specialist engineering knowledge and understanding to optimise the application of existing and emerging technology.**

**A1** Maintain and extend a sound theoretical approach in enabling the introduction and exploitation of new and advancing technology and other relevant developments. This could include an ability to:

- Identify the limits of own personal knowledge and skills
- Strive to extend own technological capability
- Broaden and deepen own knowledge base through research and experimentation.

**A2** Engage in the creative and innovative development of engineering technology and continuous improvement systems. This could include an ability to:

- Establish users' needs
- Assess marketing needs and contribute to marketing strategies
- Identify constraints and exploit opportunities for the development and transfer of technology within own chosen field
- Promote new applications when appropriate
- Secure the necessary intellectual property rights
- Develop and evaluate continuous improvement systems.

### **B Apply appropriate theoretical and practical methods to the analysis and solution of engineering problems.**

**B1** Identify potential projects and opportunities. This could include an ability to:

- Explore the territory within own responsibility for new opportunities
- Review the potential for enhancing engineering products, processes, systems and services
- Use own knowledge of the employer's position to assess the viability of opportunities.

**B2** Conduct appropriate research, and undertake design and development of engineering solutions. This could include an ability to:

- Identify and agree appropriate research methodologies
- Assemble the necessary resources
- Carry out the necessary tests
- Collect, analyse and evaluate the relevant data
- Draft, present and agree design recommendations
- Undertake engineering design.

**B3** Implement design solutions, and evaluate their effectiveness. This could include an ability to:

- Ensure that the application of the design results in the appropriate practical outcome
- Identify the required cost, quality, safety, reliability, appearance, fitness for purpose and environmental impact of the outcome
- Determine the criteria for evaluating the design solutions
- Evaluate the outcome against the original specification

- Actively learn from feedback on results to improve future design solutions and build best practice.

**C Provide technical and commercial leadership.**

**C1** Plan for effective project implementation.

This could include an ability to:

- Identify the factors affecting the project implementation
- Lead on preparing and agreeing implementation plans and method statements
- Ensure that the necessary resources are secured and brief the project team
- Negotiate the necessary contractual arrangements with other stakeholders (client, subcontractors, suppliers, etc.).

**C2** Plan, budget, organise, direct and control tasks, people and resources.

This could include an ability to:

- Set up appropriate management systems
- Agree quality standards, programme and budget
- Organise and lead work teams, coordinating project activities
- Ensure that variations from quality standards, programme and budgets are identified, and that corrective action is taken
- Gather and evaluate feedback, and recommend improvements.

**C3** Lead teams and develop staff to meet changing technical and managerial needs. This could include an ability to:

- Agree objectives and work plans with teams and individuals
- Identify team and individual needs, and plan for their development
- Lead and support team and individual development
- Assess team and individual performance, and provide feedback.

**C4** Bring about continuous improvement through quality management.

This could include an ability to:

- Promote quality throughout the organization and its customer and supplier networks
- Develop and maintain operations to meet quality standards
- Direct project evaluation and propose recommendations for improvement.