

CEng Competences

<p>The Competence and Commitment Standard for Chartered Engineers.</p>	<p>Guidance – These are examples of activities which could demonstrate that you have achieved the CEng criteria.</p>
<p>Chartered Engineers must be competent throughout their working life, by virtue of their education, training and experience, to:</p>	
<p>A Use a combination of general and specialist engineering knowledge and understanding to optimise the application of existing and emerging technology.</p>	
<p>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:</p> <ul style="list-style-type: none"> ■ 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. 	<p>Engage in formal post-graduate academic study. Learn and develop new engineering theories and techniques in the workplace. Broaden your knowledge of engineering codes, standards and specifications.</p>
<p>A2 Engage in the creative and innovative development of engineering technology and continuous improvement systems. This could include an ability to:</p> <ul style="list-style-type: none"> ■ 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. 	<p>Lead/manage market research, and product and process research and development. Cross-disciplinary working involving complex projects. Conduct statistically sound appraisal of data. Use evidence from best practice to improve effectiveness.</p>



<p>B Apply appropriate theoretical and practical methods to the analysis and solution of engineering problems.</p>	
<p>B1 Identify potential projects and opportunities. This could include an ability to:</p> <ul style="list-style-type: none"> ■ 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. 	<p>Involvement in the marketing of and tendering for new engineering products, processes and systems. Involvement in the specification and procurement of new engineering products, processes and systems. Set targets, and draft programmes and action plans. Schedule activities.</p>
<p>B2 Conduct appropriate research, and undertake design and development of engineering solutions. This could include an ability to:</p> <ul style="list-style-type: none"> ■ 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, taking account of cost, quality, safety, reliability, appearance, fitness for purpose and environmental impact ■ Undertake engineering design. 	<p>Carry out formal theoretical research. Carry out applied research on the job. Lead/manage value engineering and whole life costing. Lead design teams. Draft specifications. Develop and test options. Identify resources and costs of options. Produce concept designs, and develop these into detailed designs.</p>
<p>B3 Implement design solutions, and evaluate their effectiveness. This could include an ability to:</p> <ul style="list-style-type: none"> ■ Ensure that the application of the design results in the appropriate practical outcome ■ Implement design solutions, taking account of critical constraints ■ 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. 	<p>Follow the design process through into product or service realisation and its evaluation. Prepare and present reports on the evaluation of the effectiveness of the designs. Manage product improvement. Interpret and analyse performance. Determine critical success factors.</p>
<p>C Provide technical and commercial leadership.</p>	
<p>C1 Plan for effective project implementation. This could include an ability to:</p> <ul style="list-style-type: none"> ■ 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.). 	<p>Lead/manage project planning activities. Produce and implement procurement plans. Carry out project risk assessments. Collaborate with key stakeholders, and negotiate agreement to the plans. Plan programmes and delivery of tasks. Identify resources and costs. Negotiate and agree contracts/work orders.</p>

<p>C2 Plan, budget, organise, direct and control tasks, people and resources.</p> <p>This could include an ability to:</p> <ul style="list-style-type: none"> ■ Set up appropriate management systems ■ Agree quality standards, programme and budget within legal and statutory requirements ■ 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. 	<p>Take responsibility for and control project operations. Manage the balance between quality, cost and time. Manage contingency systems. Manage project funding, payments and recovery. Satisfy legal and statutory obligations. Lead/manage tasks within identified financial, commercial and regulatory constraints.</p>
<p>C3 Lead teams and develop staff to meet changing technical and managerial needs.</p> <p>This could include an ability to:</p> <ul style="list-style-type: none"> ■ 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. 	<p>Carry out/contribute to staff appraisals. Plan/contribute to the training and development of staff. Gather evidence from colleagues of the management, assessment and feedback that you have provided. Carry out/contribute to disciplinary procedures.</p>
<p>C4 Bring about continuous improvement through quality management.</p> <p>This could include an ability to:</p> <ul style="list-style-type: none"> ■ Promote quality throughout the organisation and its customer and supplier networks ■ Develop and maintain operations to meet quality standards ■ Direct project evaluation and propose recommendations for improvement. 	<p>Plan and implement best practice methods of continuous improvement, e.g. ISO 9000, EFQM, balanced scorecard. Carry out quality audits. Monitor, maintain and improve delivery. Identify, implement and evaluate changes to meet quality objectives.</p>
<p>D Demonstrate effective interpersonal skills.</p>	
<p>D1 Communicate in English* with others at all levels.</p> <p>This could include an ability to:</p> <ul style="list-style-type: none"> ■ Contribute to, chair and record meetings and discussions ■ Prepare letters, documents and reports on complex matters ■ Exchange information and provide advice to technical and non-technical colleagues. 	<p>Reports, minutes of meetings, letters, programmes, drawings, specifications.</p>
<p>D2 Present and discuss proposals.</p> <p>This could include an ability to:</p> <ul style="list-style-type: none"> ■ Prepare and deliver presentations on strategic matters ■ Lead and sustain debates with audiences ■ Feed the results back to improve the proposals. 	<p>Presentations, records of discussions and their outcomes.</p>

* Subject to provisions of Welsh Language Act 1993 and any relevant European legislation.

<p>D3 Demonstrate personal and social skills. This could include an ability to:</p> <ul style="list-style-type: none"> ■ Know and manage own emotions, strengths and weaknesses ■ Be aware of the needs and concerns of others ■ Be confident and flexible in dealing with new and changing interpersonal situations ■ Identify, agree and lead work towards collective goals ■ Create, maintain and enhance productive working relationships, and resolve conflicts. 	<p>Records of meetings. Evidence from colleagues of your personal and social skills. Take responsibility for productive working relationships. Apply diversity and anti-discrimination legislation.</p>
<p>E Demonstrate a personal commitment to professional standards, recognising obligations to society, the profession and the environment.</p>	
<p>E1 Comply with relevant codes of conduct. This could include an ability to:</p> <ul style="list-style-type: none"> ■ Comply with the rules of professional conduct of own professional body ■ Lead work within all relevant legislation and regulatory frameworks, including social and employment legislation. 	<p>Work with a variety of conditions of contract. Demonstrate initiative in and commitment to the affairs of your professional body.</p>
<p>E2 Manage and apply safe systems of work. This could include an ability to:</p> <ul style="list-style-type: none"> ■ Identify and take responsibility for own obligations for health, safety and welfare issues ■ Ensure that systems satisfy health, safety and welfare requirements ■ Develop and implement appropriate hazard identification and risk management systems ■ Manage, evaluate and improve these systems. 	<p>Undertake formal H&S training. Work with H&S legislation and best practice, e.g. HASAW 1974, CDM regs, OHSAS 18001:2007 and company safety policies. Carry out safety audits. Identify and minimise hazards. Assess and control risks. Evaluate the costs and benefits of safe working. Deliver strategic H&S briefings and inductions.</p>
<p>E3 Undertake engineering activities in a way that contributes to sustainable development. This could include an ability to:</p> <ul style="list-style-type: none"> ■ Operate and act responsibly, taking account of the need to progress environmental, social and economic outcomes simultaneously ■ Use imagination, creativity and innovation to provide products and services which maintain and enhance the quality of the environment and community, and meet financial objectives ■ Understand and secure stakeholder involvement in sustainable development. 	<p>Carry out environmental impact assessments. Carry out environmental risk assessments. Plan and implement best practice environmental management systems, e.g. ISO 14000. Work within environmental legislation. Adopt sustainable practices. Achieve “triple bottom line” (i.e. social, economic and environmental) outcomes.</p>
<p>E4 Carry out continuing professional development necessary to maintain and enhance competence in own area of practice. This could include an ability to:</p> <ul style="list-style-type: none"> ■ Undertake reviews of own development needs ■ Prepare action plans to meet personal and organisational objectives ■ Carry out planned (and unplanned) CPD activities ■ Maintain evidence of competence development ■ Evaluate CPD outcomes against the action plans ■ Assist others with their own CPD. 	<p>Keep up to date with national and international engineering issues. Maintain CPD plans and records. Involvement with the affairs of your professional body. Evidence of your development through on-the-job learning, private study, in-house courses, external courses and conferences.</p>