ACIBSE Competence Framework: Digital Engineering Evidence Examples

Associate members maintain, operate and manage applications of current and developing technology, and may undertake engineering design, development, manufacture, construction and operation.

A. Knowledge and understanding

Associates shall use a combination of general and specialist engineering knowledge and understanding to apply existing and emerging technologies.

This competence is about having knowledge of the technologies, standards and practices relevant to the applicant's area of work and having evidence of maintaining and applying this knowledge.

Objective	Evidence Examples	Digital Evidence Examples
A1. Maintain and extend a sound theoretical approach to the application of technology in engineering practice.	- Identifying the limits of your knowledge and skills. - Taking steps to develop and extend personal knowledge of appropriate technology, both current and emerging. - Applying newly gained knowledge successfully in a task or project. - Reviewing current procedures and processes and recommended improvements or changes to reflect best practice. - Developing knowledge needed to work in a new industry area or discipline.	- Demonstrate how you remain aware of the latest software developments and applications. - Using examples, demonstrate how you develop your knowledge through technical training. - Examples could be CPDs, conferences, webinars or internal or external training courses. These could be on design or software. - Demonstrate how new software developments can fit into the wider ecosystem of digital tools for your discipline.
A2. Use a sound evidence-based approach to problem solving and contribute to continuous improvement.	- Applying knowledge and experience to investigate and solve problems arising during digital engineering tasks and implementing corrective action. - Identifying opportunities for improvements and how these have been (or could be) implemented. - Using an established process to analyse issues and establish priorities.	- Evaluate effective methods of applying digital tools to solve problems and improve processes. - Show how you have evaluated a process or software and written an implementation plan. - Demonstrate how you have evaluated an engineering problem and come to a solution involving digital tools. This could be a problem on a project or procedure across projects. Example: A review of model templates for updates and improvements or updates to internal standards to meet changing requirements.

B. Design, development and solving engineering problems

Associates shall apply appropriate theoretical and practical methods to design, develop, manufacture, construct, commission, operate, maintain, decommission and recycle engineering processes, systems, services and products.

This competence is about the ability to identify appropriate methods and approaches to use to undertake a task within their area of practice, in a safe and sustainable way, and to make a significant contribution to the development of a design or process or the maintenance of operations.

Objective	Evidence Examples	Digital Evidence Examples
B1. Identify, review and select techniques, procedures and methods to undertake engineering tasks.	- Establishing the engineering steps needed to carry out a task efficiently. - Identifying the available digital products or processes needed to undertake an engineering task and establishing a means of identifying the most suitable solution. - Preparing technical specifications. - Reviewing and comparing responses to the technical aspects of tender invitations. - Establishing user requirements for improvements.	- Evaluate and compare different methods for modelling. - Propose and discuss new ideas for modelling techniques within your team. - Show how you have reviewed to suit project Information Management (BIM) requirements. - Demonstrate how you have applied learning from previous projects and experiences to improve processes and workflows in subsequent projects.
B2. Contribute to the design and development of engineering solutions.	- Contributing to the identification and specification of design and development requirements for digital engineering products, processes, systems and services. - Identifying operational risks and evaluating possible digital solutions, taking account of cost, quality, safety, reliability, accessibility, appearance, fitness for purpose, security (including cyber security), intellectual property constraints and opportunities, and environmental impact. - Collecting and analysing results. - Carrying out necessary tests.	- Assist project engineers with creating design options and proposals. - Contribute model output to design reports. - Demonstrate how you have contributed to project reviews. - Demonstrate your process of product or model reviews, showing, for example, review of hard and soft clashes in a design model, meeting information management requirements of the project, or reviewing the function of a digital tool against the engineering requirements.

Objective	Evidence Examples	Digital Evidence Examples
B3. Implement design solutions for equipment or processes and contribute to their evaluation.	- Identifying the resources required for implementation. - Implementing design solutions, taking account of critical constraints, including due concern for safety and sustainability - Identifying problems during. implementation and taking corrective action. - Contributing to recommendations for improvement and actively learning from feedback on results.	- Implement solutions to broken models. - Written guidance on how to resolve commonly encountered problems. - Implementation of a process or workflow to improve project outcomes. - Assessing project outcomes and their effectiveness. Discuss the feedback loop. - Led or participated in a lessons-learnt process. Explain your part and how you have implemented change. - This could be connected to software that improves project efficiency. How was this identified and developed? - Have you been involved in Design for manufacturing and assembly (DfMA) processes or development of prototypes? Explain this.

C. Responsibility, management and leadership

Associate members shall provide technical and commercial management.

This competence is about the ability to plan the applicant's own work and manage or specify the work of others effectively, efficiently and in a way which provides leadership at an appropriate level, whether technical or commercial.

Leadership is not necessarily about having a formal line management role. In matrix management and other types of organisational structure, where Associates are working within complex and varied working relationships, they will provide leadership to achieve objectives.

This competence is also about the ability to consider and identify improvements to quality.

Objective	Evidence Examples	Digital Evidence Examples
C1. Plan the work and resources needed to	- Identifying factors affecting the project implementation.	- Contribute to a project's BIM Execution plan.

Objective	Evidence Examples	Digital Evidence Examples
enable effective implementation of engineering tasks and projects.	- Carrying out holistic and systematic risk identification, assessment and management. - Preparing and agreeing implementation plans and method statements. - Securing the necessary resources and confirming roles in a project team - Applying the necessary contractual arrangements with other stakeholders (clients, subcontractors, suppliers, etc).	- Advise others on the considerations that Information Management (BIM) will have on resourcing. - Demonstrate your leadership in a project team setting, contributing to resourcing, budgets and project tasks. - Demonstrate your leadership in a digital or development team on a project. - Engagement with clients, lead internal or external coordination meetings, managed deliverables. - Explain your part in the development of BIM or project execution plans with the design team and any other associated documents. - If you have assisted the client to develop the Client's Information Requirements documentation, explain this process. - Show how you have checked that deliverables have met the agreed standards on your projects.
C2. Manage (organise, direct and control), programme or schedule, budget and resource elements of engineering tasks or projects	- Operating appropriate management systems. - Working to the agreed quality standards, programme and budget, within legal and statutory requirements. - Managing work teams, coordinating project activities. - Identifying variations from quality standards, programme and budgets, and taking corrective action. - Evaluating performance and recommending improvements.	- Understand and work to BIM standards and specifications such as ISO19650 series COBie, Uniclass2015. - How do you manage your team? What meetings do you join or lead to do this and what systems do you use? - Explain how you monitor time, quality, and cost of digital deliverables across your team and for others? - Explain how you interface with external clients, contractors, architects etc. This could be coordination, meeting in person, phone or VC calls. - What input have you had on resourcing for your team – explain this.
C3. Manage teams, or the input of others, into own work and assist others to meet	- Agreeing objectives and work plans with teams and individuals. - Reinforcing team commitment to professional standards.	- Development and delivery of training. - Management or mentoring of a team or individual – how do you support each of the team and their growth?

Objective	Evidence Examples	Digital Evidence Examples
changing technical and management needs.	- Leading and supporting team and individual development. - Assessing team and individual performance and providing feedback. - Seeking input from other teams or specialists where needed and managing the relationship.	- Explain any review / appraisal process that you have with your team. - What have you done to share your digital experience and knowledge across your organisation? - Share which types of training you have delivered and the recipients. - Have you delivered any internal or external technical or digital presentations?
C4. Take an active role in continuous quality improvement.	- Ensuring the application of quality management principles by team members and colleagues. - Managing operations to maintain quality standards eg ISO 9000, EQFM. - Evaluating projects and making recommendations for improvement. - Implementing and sharing the results of lessons learned.	- Engagement with QA and QC systems and processes. Perhaps to align with any industry standards? - Review of deliverables and communication of findings through recommendations. - Explain how you have shared data in a structured and agreed manner, such as using a CDE on a project. - What have you done to improve best practice across your project or business?

D. Communication and interpersonal skills

Associate members shall demonstrate effective communication and interpersonal skills.

This is the ability to work with others constructively, to explain ideas and proposals clearly and to discuss issues objectively and constructively.

Objective	Evidence Examples	Digital Evidence Examples
D1. Communicate effectively with others, at all levels, in English.	- Contributing to, chairing and recording meetings and discussions. - Preparing communications, documents and reports on technical matters. - Exchanging information and providing advice to technical and non-technical colleagues. - Engaging or interacting with professional networks.	- Work as a Task Information Manager on a project. Explain what you do in this role. - Show how you have contributed and led a team or design meeting. This could be coordination, design reviews etc. - Show how you have assisted other team members this could be how to use software or designing systems. - Demonstrate how you have helped determine and record client requirements on a project. - Give an example of information exchanges on projects, such as using a Common Data Environment (CDE) or other structured data sharing platform, appropriate for the project.
D2. Clearly present and discuss proposals, justifications and conclusions.	- Preparing and delivering appropriate presentations. - Managing debates with audiences. - Feeding the results back to improve the proposals. - Contributing to the awareness of risk.	- Explain your role in the proposal and RFP process. Have you answered digital related questions, a capability statement or been to project interviews? - Have you led or been a member of a team to develop a business strategy? Explain this. - Have you written or contributed to a business plan? – this could be for a new software. - Explain how you have taken part in any company strategy processes.
D3. Demonstrate personal and social skills and awareness of	- Knowing and managing own emotions, strengths and weaknesses. - Being confident and flexible in dealing with new and changing interpersonal situations.	- Have you taken any courses to develop your soft skills? This could include emotions, strengths, and weaknesses. - Explain where you have had to deal with a challenging situation. This might be a difficult client or a problem

diversity and inclusion issues.	- Identifying, agreeing and working towards collective goals. - Creating, maintaining and enhancing productive working relationships, and resolving conflicts. - Being supportive of the needs and concerns of others, especially where this relates to diversity and inclusion.	with a staff member. Explain how you approached and resolved this. - How have you supported the different needs and requirements of your team?

E. Personal and professional commitment

Associate members shall demonstrate a personal commitment to professional standards, in a safe and environmentally acceptable way, recognising obligations to society and the profession as a whole.

This competence is about ensuring that the applicant is acting in a professional and ethical manner, as defined in CIBSE's Code of Conduct, in their work and in their dealings with others. An Associate should set a standard and example to others ensuring they undertake and record appropriate continual professional development.

Objective	Evidence Examples	Digital Evidence Examples
E1. Understand and comply with relevant codes of conduct.	- Demonstrating compliance with CIBSE's Code of Professional Conduct. - Identifying aspects of the Code particularly relevant to your role. - Managing work within all relevant legislative and regulatory frameworks, including social and employment legislation.	- Demonstrate that you have read and agree with the code of professional conduct. - Explain how the code of conduct relates to your role? - How do you keep up to date with these standards?
E2. Understand the safety implications of their role and manage, apply and improve safe systems of work.	- Identifying and taking responsibility for your own obligations for health, safety and welfare issues. - Managing systems that satisfy health, safety and welfare requirements. - Developing and implementing appropriate hazard identification and risk management systems and culture. - Managing, evaluating and improving these systems.	- How have you implemented health, safety and welfare into your projects. This could be a process or development of systems. - Demonstrate how your knowledge of health, safety and welfare and the related standards is kept up to date. This could be online or site training, Certifications. - Do you manage or review these standards? Explain how.

Objective	Evidence Examples	Digital Evidence Examples
	- Applying a sound knowledge of health and safety legislation, for example: HASAW 1974, CDM regulations, ISO 45001 and company safety policies.	Are you applying health, safety and welfare to your models, drawings, or documents? Explain what you are doing.
E3. Understand the principles of sustainable development and apply them in their work.	- Operating and acting responsibly, taking account of the need to progress environmental, social and economic outcomes simultaneously. - Recognising how sustainability principles, as described in the Engineering Council's Guidance on Sustainability can be applied in your day-to-day work. - Providing products and services which maintain and enhance the quality of the environment and community and meet financial objectives. - Understanding and encouraging stakeholder involvement in sustainable development - Using resources efficiently and effectively. - Taking action to minimise environmental impact in your area of responsibility.	- Explain how you have applied sustainability principles to your role. - Explain how you act in your day-to-day life to ensure you behave responsibly, consider environmental, social and economic outcomes. - What action do you take to reduce environmental impact? This might be different approaches to design, implementing software or reduction of materials. - Demonstrate how your digitalisation work is enabling more sustainable behaviour across your organisation and/or your client's organisations.
E4. Carry out and record the Continuing Professional Development (CPD) necessary to maintain and enhance competence in their own area of practice.	- Undertaking reviews of your own development needs - Planning how to meet personal and organisational objectives - Carrying out and recording planned and unplanned CPD activities - Maintaining evidence of competence development - Evaluating CPD outcomes against any plans made - Assisting others with their own CPD	- Explain how you are progressing your development? CPD activities or training, attending conferences, research etc. - How are you recording evidence of this development? - How have you set goals and worked toward these goals? - Explain how you have supported your team to achieve their goals. - Are you part of any industry groups? Outline your roles and activities.
E5. Understand the ethical issues that may arise in their role and carry out their responsibilities in an ethical manner.	- Understanding the ethical issues that you may encounter in your role. - Giving an example of where you have applied ethical principles as described in the Engineering Council's Statement of Ethical Principles.	- Explain what the ethical issues mean to you and how this is applied in your work. - You can pick a few of the principles and give examples where you have applied this to your life or work.

Objective	Evidence Examples	Digital Evidence Examples
	- Giving an example of where you have applied or upheld ethical principles as defined by your organisation or company.	- Example where you have stood by your design decisions, even if pressured to take shortcuts. - Example of where you have responsibly questioned decisions from those around you which did not appear to uphold ethical standards.