

the engineering graduate capabilities continuum

a continuum of learning outcomes

This continuum explains what an engineering student could be asked to show or do to prove their competence in generic professional skills.

The generic skills are listed and evidence required to claim one of three levels of capability is described. The capability levels are hierarchical in that Level 2 builds from and includes Level 1.

The generic skills and levels are linked to institutional graduate qualities (lefthand column) and Engineers Australia attributes (righthand column).

The EGCC can be used as a guide for student portfolios, as a means to design new engineering courses, or as a framework to audit and report on assessment tasks across all years of an engineering degree.

UOW Graduate Qualities	Engineering Graduate Capabilities	Level of Capability			Engineers Australia Attributes of Graduates from an Accredited Program
		Level 1	Level 2	Level 3	
Informed Have a sound knowledge of an area of study or profession and understand its current issues, locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas.	1 Professional knowledge, grounding & awareness	Maintain and update knowledge of own discipline. Seek and respond to feedback.	Learn from others within and outside own discipline. Evaluate own and others' engineering work process and product. Aware of current local and international issues, and their professional, legal and social/ethical impacts.	Adapt engineering work practice based on professional learning, taking into account local and international issues.	In-depth technical competence in at least one engineering discipline Expectation of the need to undertake lifelong learning, and capacity to do so
	2 Information literacy, gathering & processing	Access range of information sources. Select relevant readings and use effective referencing system.	Synthesise and integrate information to support an argument or strategy.	Critique and evaluate an argument or strategy.	
Independent learners Engage with new ideas and ways of thinking and critically analyse issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.	3 Research, analysis & evaluation	Interpret and refine a research question. Use standard techniques and interpret data to solve defined research question.	Define a research question. Use databases and other sources for systematic research. Select appropriate techniques from a range of possibilities to answer a question. Comment on the validity and significance of findings.	Design a structured approach to researching a question. Propose new directions for research based on findings.	Ability to apply knowledge of basic science and engineering fundamentals
	4 Problem solving skills	Analyse and define a problem. Use a range of standard options and rigorous approaches to solve a problem.	Adapt solutions to new types of problems, within a range of constraints (eg time, technical, financial, etc).	Use observations and ideas from diverse sources to conceptualise and develop a novel solution to a problem.	Ability to undertake problem identification, formulation and solution Ability to utilise a systems approach to design and operational performance
Effective communicators Articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognise how culture can shape communication.	5 Written communication	Document basic information. Summarise and describe in a logical structure using clear syntax and correct grammar.	Write a document to support a position, using suitable structure and style for the audience, supported by evidence. Deliver and receive information using appropriate graphics, tables, equations, flow charts, etc.	Write a substantial document that pulls together diverse ideas and integrates evidence. Critically evaluate strengths and weaknesses of arguments. Use and present evidence well to support conclusions.	Ability to communicate effectively, not only with engineers but also with the community at large
	6 Oral communication	Effectively provide and receive information with individuals or groups, formally and informally.	Design and deliver a formal presentation appropriate to an audience. Elicit feedback and clarification of different points of view.	Provide an oral defence and response to feedback on major proposal. Adapt style/manner of delivery in response to audience, and cross-cultural needs. Consult and negotiate with a range of stakeholders	
	7 Teamwork	Contribute to group decision-making, meet obligations as a member of a group working on a straightforward task.	Contribute to timely, successful completion of a more complex group task. Understand roles in teams and how teams develop. Make best use of members' skills.	Lead a team to successful completion of a major project, complying with a range of constraints (eg time, technical, financial, etc), minimising/resolving conflict.	Ability to function effectively as an individual and in multi-disciplinary and multicultural teams, with the capacity to be a leader or manager as well as an effective team member
Responsible Understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.	8 Respect for views, values, culture of others	Work with people from other cultures and countries.	Understand and respect other people's perspectives.	Consult other people and incorporate their input in engineering design/decision processes.	Understanding of professional and ethical responsibilities and commitment to them
	9 Ethics and Professionalism	Explain ethical engineering according to the Engineers Australia Code of Ethics.	Given engineering's status as a self-regulating and service oriented profession, distinguish between own (personal) morals and professional ethics.	Given an ethical conundrum, describe & justify the 'right' course of action, and explain how to act to maintain a position of trust with society.	
	10 Sustainability, societal & environmental impact	Appreciate sustainability. Aware of social and environmental impacts of engineering.	Predict and minimise adverse social and environmental impacts.	Take a leading role in enacting sustainability and socially responsible practice in all aspects of engineering work.	Understanding of the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development Understanding of the principles of sustainable design and development