



**REGISTRATION  
AUTHORITY**  
FOR CHARTERED PROFESSIONAL ENGINEERS

# Engineering Academic guidance

June 2024

If you're an engineering academic, use this additional guidance to complete your Chartered assessment.

As an engineering academic, you play a critical role in forming the profession and developing engineering knowledge. Whether your primary focus is on research, educating future generations or academic leadership, you'll benefit from being part of our community.

Chartered Member is an internationally benchmarked quality mark that means you'll be recognised and celebrated for your competence and professional standing.

## MEETING THE COMPETENCIES

You'll need to provide evidence specific to your engineering academic activities for the four competencies:

1. Engineering knowledge
2. Managing engineering work
3. Professional acumen
4. Developing technical solutions

### ENGINEERING KNOWLEDGE

Specific competencies covered here relate to:

- » Engineering principles (general) – knowledge of accepted principles supporting good practice for engineering
- » Engineering principles (jurisdiction-specific) – knowledge of accepted principles supporting good practice in the jurisdiction in which you practice (New Zealand if applying for CPEng)
- » Currency of knowledge – maintaining the currency of engineering knowledge and skills.

Engineering knowledge is a fundamental requirement for engineering academics, who are typically required to demonstrate a breadth and/or depth of knowledge that extends beyond the exemplifying academic qualification for entry to the engineering profession – an undergraduate degree/diploma recognised under an Accord.

Your self-assessment should provide a summary of the structured programme of knowledge and skills development that has prepared you to practise as an engineer in your practice area and your approach to ongoing professional development. It should also include a summary of the engineering knowledge demands of your work generally and your understanding of the principles, practices, standards, codes regulations – underpinning good practice in New Zealand.

The evidence you submit should support the general claims in your self-assessment and highlight actual examples of the application of:

- » **General engineering principles**

In an academic context, the application of general engineering knowledge and principles is likely to be evident in much of the work that you do, and evident in your outputs. These outputs will include delivery material and programme design for the teaching practice area, and research papers and reports for the research practice area.

- » **New Zealand-specific principles, practices, standards, codes regulations to the extent that this is required in the work that you do**

The extent to which you engage with New Zealand standards, codes and regulations will vary depending on the nature of your work. There is likely to be a stronger requirement in this area if you are engaged in consultancy type work, but it may be less relevant in a research context. Equally, a level of awareness or understanding of codes and standards will be required in the context of your teaching activities, with a deeper understanding likely to be necessary if you are teaching more applied courses or programmes.

- » **The development and or application of new knowledge.**

### MANAGING ENGINEERING WORK

Specific competence elements covered here include:

- » Decision making – be responsible for making decisions on (part or all of) engineering activities
- » Management – manage (part or all of) engineering activities in accordance with good engineering management practice
- » Judgement – exercise sound (professional) engineering judgement
- » Risk management – identify, assess and manage engineering risk.

Your self-assessment should explain the engineering management and decision-making responsibilities you have, the sorts of engineering activities that you encounter and the approaches that you take to making sound engineering judgement in these situations.

You should include a summary of the approaches that you take to managing engineering risk, with particular attention to your approach to safety, sustainability and quality management. The evidence you submit will need to provide actual examples that support the general claims in your self-assessment.

While not all engineers will be responsible for managing people or projects, all engineers are required to assume a level of responsibility for managing aspects of engineering work and for associated judgement

and decision-making. This is as true for engineering academics as it is for engineers working in other sectors.

For some engineering academics, these 'managing' competencies assume greater significance and can be demonstrated in examples of work that they undertake to manage activities in relation to an academic department, faculty, programme, research group, or substantial group research project. For other engineering academics, the focus is likely to involve:

- » Managing their own teaching contribution (the ongoing development, alignment and quality of the academic course(s) they are responsible for) in the context of the wider, and constantly evolving, academic programme and environment.
- » Managing complex (albeit individual or small group) research or consultancy proposals, projects or activities.
- » Managing students at undergraduate or postgraduate level.

## **PROFESSIONAL ACUMEN**

Specific competence elements covered here include:

- » Ethics – conducting professional engineering activities to an ethical standard at least equivalent to the Code of Ethical Conduct
- » Social, cultural and environmental impacts – recognising the reasonably foreseeable social, cultural, and environmental effects of engineering activities generally
- » Communication – communicating clearly to engineers and others.

Your self-assessment should demonstrate your understanding of your ethical obligations and how this influences the way that you conduct your engineering activities. You should also summarise your general understanding of the potential social, cultural and environmental impacts of your work and the approaches that you take to optimising societal outcomes. The evidence you submit will need to provide actual examples that support the general claims in your self-assessment. Examples of work that you might draw on could include:

- » Involvement in programme level initiatives to address the delivery and assessment of professional practice attributes.
- » Delivery of courses, or substantive course components, that directly address professional practice competencies and/ or examples of the integration of professional practice competencies into technical courses or project work.
- » Examples where you have addressed ethical or other professional practice matters as part of your own research, or the supervision of substantive student research activities.
- » Research funding proposals addressing cultural, ethical or other professional practice issues.
- » Competencies in communication would be demonstrated by dissemination of research through a combination of papers and presentations at national and international conferences.

## **DEVELOPING TECHNICAL SOLUTIONS**

Specific competencies covered here relate to:

- » Defining, investigating, and analysing engineering problems
- » Designing or developing solutions to engineering problems

Engineers engineer a better world. The application of engineering principles to develop technical products or solutions that benefit society is a central defining characteristic of the engineer. There are a range of tasks or activities that contribute to the development of a product or outcome, including: researching, planning, investigating, scoping, modelling, designing, composing, constructing, supervising, (project) managing, leading, reviewing, or teaching/educating.

This is reflected in the fact that engineers fill a wide range of engineering roles, including: research and development, design, product development, project management, asset management/maintenance, contract management, construction management, production management, technical leadership, business leadership, governance, teaching and learning.

The competence standard and assessment process are inclusive of engineers working in any of these roles.

Safety, sustainability and quality are elements that must be considered throughout the development of any technical solution and this applies equally in an academic context. Irrespective of the nature of the engineering role you have or activities you undertake, it is important that your self-assessment shows how consideration of these factors is integral to your work.

Your self-assessment should briefly summarise the sorts of engineering problems you encounter (from a research, consultancy and/or teaching and learning perspective), and the approaches that you take to analysing and resolving them.

The evidence you submit should provide actual examples that support the general claims in your self- assessment.

Research-based activities are likely to include:

- » Specific nominated research outputs drawn from your latest PBRF portfolio.
- » Other more industry facing research or consultancy work, which might not have been prioritised as part of a PBRF portfolio. Examples of this might include:
  - » Involvement with standards committees
  - » Technical seminars in industry
  - » Industry based consultancy work
  - » Expert witness work.

In a teaching and learning context you might include:

- » Evidence of the development/delivery or leadership of elements of an Engineering New Zealand accredited engineering programme including a clear statement of the pedagogical rationale and learning outcomes.
- » Coherent design and delivery of teaching and assessment programmes at a course or programme level. Examples of complex educational course or programme design are likely to include evidence of:
  - » Constructive alignment with overall programme outcomes
  - » Adapting to changes in student capability/student profiles
  - » Incorporation of blended learning approaches
  - » Incorporation of advancing technical knowledge
- » Final year project and/or thesis supervision.

## COMPILING YOUR COMPETENCE APPLICATION

### WORK HISTORY RECORD

This should be a full academic CV outlining career progression and significant engineering activities, including:

- » Positions held in industry and academia
- » Key publications
- » Grants gained
- » Thesis/research projects supervised
- » Courses taught
- » Key research areas
- » Administrative/service duties performed
- » Consulting/standard setting/expert witness activities.

### CPD RECORDS

Continuing professional development is fundamental to an engineering academic's work.

If your career has been focused on research so far, you can demonstrate this by:

- » Your research record and evidence of research progression
- » Published work, typically journal publications
- » Supervision of postgraduates.

You could submit elements of your PBRF portfolio as evidence of the above.

If your career has been focused on teaching and learning, significant professional development is likely to be associated with:

- » New course development
- » Review and development of existing courses to reflect evolving practices/knowledge/technologies.
- » Industry engagement to maintain currency of engineering practice knowledge
- » Contribution to academic quality processes at your institution
- » Contribution to accreditation processes
- » Completion of a certificate or diploma in teaching.

The Assessment Panel wants to be assured you are taking the right steps to maintain the currency of your engineering knowledge and skills.

You can record CPD activities in the Members area of our website, then in your application supplement by referring to with reference

### **Your work sample statement or annotations**

Each work sample (which may be made up of separate uploaded files), should be supplemented by a work sample statement or annotations (of 500-1500 words). This is essentially a justification of why you have chosen this piece of work for inclusion in your application. It should include:

- » A general description of the work, your role in it, and the outcome that was achieved
- » The complexities or challenges that you faced and how these were resolved
- » A description of aspects of the work that evidence competencies. This should include clear cross- referencing to where this is evidenced in the uploaded file document(s).

#### **If you're mostly teaching and learning**

Your work samples could be based around a course you teach or have academic responsibility for. Your general description should put the course in the context of the overall qualification and summarise your:

- » contribution in the development of the course or to programme renewal;
- » processes for developing curriculum and learning outcomes and validating that the material is still relevant to the profession;
- » pedagogic approach; and
- » learning and assessment strategy.

You should describe how the work demonstrates competencies groupings (see below for further guidance).

#### **If you're focused on research**

Your work samples could be around your research themes/platforms. Your general introduction to the work should include:

- » Overall objectives of the research programme
- » Funding obtained
- » How the research informs engineering practice or education
- » Management responsibility
- » Outcomes in the form of papers and other publications.

You can build on this to describe how the work demonstrates competences groupings (see below for further guidance).

Many academics will have both teaching and research roles, so can include evidence portfolios for both.



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The Registration Authority under the Chartered Professional Engineers of New Zealand Act 2002 is the Institution of Professional Engineers New Zealand (trading as Engineering New Zealand).