

Master of Engineering (Civil: Structural)

Mapping of Program Learning Outcomes with Graduate Attributes and Engineers Australia
Stage 1 Competencies for Professional Engineers.

EA Stage 1 Competencies - Professional Engineer	Program Learning Outcomes	MEng Graduate Attributes
Knowledge and Skill Base		
<p>PE 1.1 Comprehensive, theory-based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.</p>	<p>PLO 2: Knowledge, Analysis and Judgement Graduates of this program will be able to identify, critically analyse and creatively solve intellectually complex, specialised professional engineering problems [B1] relevant to civil and structural engineering, individually or in groups, underpinned by critical analysis, innovation, self-reflection, research, evaluation, synthesis, accountability, [B1, B2] and sound engineering judgement of solutions relevant to the Professional engineering domain.</p>	<p>B1. Ability to critically analyse and evaluate complex information and theoretical concepts.</p>
<p>PE 1.2 Conceptual understanding of the, mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.</p>	<p>PLO 4: Professional Conduct, Knowledge and Ethics Graduates of this program will have an in-depth understanding of synthesis and design in specialist bodies of knowledge [D1] at the Professional Engineering level across the civil and structural engineering disciplines including: applying fundamental civil and structural engineering principles; performing displacement analysis of statically indeterminate structures; evaluating hazard, risk and performing safety system design; assessing effects of earthquakes on buildings; performing dynamic structural analysis; and systematic project management [D2].</p>	<p>B2. Ability to creatively, proactively and innovatively apply theoretical concepts, knowledge and approaches with a high level of accountability, in an engineering context.</p>
<p>PE 1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline.</p>	<p>Graduates will also demonstrate scientific, mathematical, design and international standards perspectives [D3] as ethical professional Civil/Structural engineers.</p>	<p>D1. Apply systematic synthesis and design processes within the technology domain</p>
<p>PE 1.4 Discernment of knowledge development within the engineering discipline.</p>	<p>PLO 4: Professional Conduct, Knowledge and Ethics Graduates of this program will have an in-depth understanding of synthesis and design in specialist bodies of knowledge [D1] at the Professional Engineering level across the civil and structural engineering disciplines including: applying fundamental civil and structural engineering principles; performing displacement analysis of statically indeterminate structures; evaluating hazard, risk and performing safety system design; assessing effects of earthquakes on buildings; performing dynamic structural analysis; and systematic project management [D2]. Graduates will also demonstrate scientific, mathematical, design and international standards perspectives [D3] as ethical professional Civil/Structural engineers.</p> <p>PLO 5: Research Graduates will execute applied research projects with independent scholarship, advanced research, planning, and leadership [E1] with accountability and sound research ethos; with research principles and methods relevant to the Civil/Structural engineering domain [E2] via professional and industry exposure to practice.</p>	<p>D2. Apply systematic approaches to the conduct and management of projects within the technology domain</p> <p>D3. Knowledge of international perspectives in engineering and ability to apply various national and International Standards</p>
		<p>D1. Apply systematic synthesis and design processes within the technology domain</p> <p>D2. Apply systematic approaches to the conduct and management of projects within the technology domain</p> <p>D3. Knowledge of international perspectives in engineering and ability to apply various national and International Standards</p> <p>E1. Application of advanced research and planning skills to engineering projects</p> <p>E2. Knowledge of research principles and methods in an engineering context</p>

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PE 1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline.

PLO 2: Knowledge, Analysis and Judgement

Graduates of this program will be able to identify, critically analyse and creatively solve intellectually complex, specialised professional engineering problems [B1] relevant to civil and structural engineering, individually or in groups, underpinned by critical analysis, innovation, self-reflection, research, evaluation, synthesis, accountability, [B1, B2] and sound engineering judgement of solutions relevant to the Professional engineering domain.

PLO 3: Design and Problem Solving

Graduates will use skills in established systematic design and project management methodologies, to source, analyse, synthesise, design and communicate projects and information [C1, C2] individually or in collaboration with others as team members and leaders.

Graduates will also apply complex problem-solving methods [C1] to steel and concrete structures as professional civil and structural engineers in a practical, independent, sustainable and ethical manner with a socially, environmentally and economically accountable ethos [C3].

PLO 4: Professional Conduct, Knowledge and Ethics

Graduates of this program will have an in-depth understanding of synthesis and design in specialist bodies of knowledge [D1] at the Professional Engineering level across the civil and structural engineering disciplines including: applying fundamental civil and structural engineering principles; performing displacement analysis of statically indeterminate structures; evaluating hazard, risk and performing safety system design; assessing effects of earthquakes on buildings; performing dynamic structural analysis; and systematic project management [D2].

Graduates will also demonstrate scientific, mathematical, design and international standards perspectives [D3] as ethical professional Civil/Structural engineers.

PE 1.6 Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline.

PLO 3: Design and Problem Solving

Graduates will use skills in established systematic design and project management methodologies, to source, analyse, synthesise, design and communicate projects and information [C1, C2] individually or in collaboration with others as team members and leaders.

Graduates will also apply complex problem-solving methods [C1] to steel and concrete structures as professional civil and structural engineers in a practical, independent, sustainable and ethical manner with a socially, environmentally and economically accountable ethos [C3].

PLO 4: Professional Conduct, Knowledge and Ethics

Graduates of this program will have an in-depth understanding of synthesis and design in specialist bodies of knowledge [D1] at the Professional Engineering level across the civil and structural engineering disciplines including: applying fundamental civil and structural engineering principles; performing displacement analysis of statically indeterminate structures; evaluating hazard, risk and performing safety system design; assessing effects of earthquakes on buildings; performing dynamic structural analysis; and systematic project management [D2].

Graduates will also demonstrate scientific, mathematical, design and international standards perspectives [D3] as ethical professional Civil/Structural engineers.

PLO 5: Research

Graduates will execute applied research projects with independent scholarship, advanced research, planning, and leadership [E1] with accountability and sound research ethos; with research principles and methods relevant to the Civil/Structural engineering domain [E2] via professional and industry exposure to practice.

B1. Ability to critically analyse and evaluate complex information and theoretical concepts.

B2. Ability to creatively, proactively and innovatively apply theoretical concepts, knowledge and approaches with a high level of accountability, in an engineering context.

C1. Cognitive skills to synthesise, evaluate and use information from a broad range of sources to effectively identify, formulate and solve engineering problems.

C2. Technical and communication skills to design complex systems and solutions in line with developments in engineering professional practice.

C3. Comprehension of the role of technology in society and identified issues in applying engineering technology ethics and impacts; economic; social; environmental and sustainability.

D1. Apply systematic synthesis and design processes within the technology domain

D2. Apply systematic approaches to the conduct and management of projects within the technology domain

D3. Knowledge of international perspectives in engineering and ability to apply various national and International Standards

C1. Cognitive skills to synthesise, evaluate and use information from a broad range of sources to effectively identify, formulate and solve engineering problems.

C2. Technical and communication skills to design complex systems and solutions in line with developments in engineering professional practice.

C3. Comprehension of the role of technology in society and identified issues in applying engineering technology ethics and impacts; economic; social; environmental and sustainability.

D1. Apply systematic synthesis and design processes within the technology domain

D2. Apply systematic approaches to the conduct and management of projects within the technology domain

D3. Knowledge of international perspectives in engineering and ability to apply various national and International Standards

E1. Application of advanced research and planning skills to engineering projects

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Engineering Application Ability

PE 2.1 Application of established engineering methods to complex engineering problem solving.

PLO 2: Knowledge, Analysis and Judgement

Graduates of this program will be able to identify, critically analyse and creatively solve intellectually complex, specialised professional engineering problems [B1] relevant to civil and structural engineering, individually or in groups, underpinned by critical analysis, innovation, self-reflection, research, evaluation, synthesis, accountability, [B1, B2] and sound engineering judgement of solutions relevant to the Professional engineering domain.

PLO 3: Design and Problem Solving

Graduates will use skills in established systematic design and project management methodologies, to source, analyse, synthesise, design and communicate projects and information [C1, C2] individually or in collaboration with others as team members and leaders.

Graduates will also apply complex problem solving methods [C1] to steel and concrete structures as professional civil and structural engineers in a practical, independent, sustainable and ethical manner with a socially, environmentally and economically accountable ethos [C3].

B1. Ability to critically analyse and evaluate complex information and theoretical concepts.

B2. Ability to creatively, proactively and innovatively apply theoretical concepts, knowledge and approaches with a high level of accountability, in an engineering context.

C1. Cognitive skills to synthesise, evaluate and use information from a broad range of sources to effectively identify, formulate and solve engineering problems.

C2. Technical and communication skills to design complex systems and solutions in line with developments in engineering professional practice.

C3. Comprehension of the role of technology in society and identified issues in applying engineering technology ethics and impacts; economic; social; environmental and sustainability.

PE 2.2 Fluent application of engineering techniques, tools and resources.

PLO 1: Communication

Graduates will have communication (oral and written) skills to investigate, analyse and present technical ideas, information and solutions [A1] on Civil/Structural Engineering problems and projects in a professional, independent and organised manner, across international cultures, individually and in teams, within the professional engineering domain [A2].

Graduates will also demonstrate professional conduct and accountability befitting Professional Engineers via industry exposure practice [A2] – integrated and consolidated within the various Civil/Structural engineering topics.

PLO 3: Design and Problem Solving

Graduates will use skills in established systematic design and project management methodologies, to source, analyse, synthesise, design and communicate projects and information [C1, C2] individually or in collaboration with others as team members and leaders.

Graduates will also apply complex problem solving methods [C1] to steel and concrete structures as professional civil and structural engineers in a practical, independent, sustainable and ethical manner with a socially, environmentally and economically accountable ethos [C3].

A1. Cognitive and technical skills to investigate, analyse and organise information and ideas and to communicate those ideas clearly and fluently, in both written and spoken forms appropriate to the audience.

A2. Ability to professionally manage oneself, teams, information and projects and engage effectively and appropriately across a diverse range of international cultures in leadership, team and individual roles.

C1. Cognitive skills to synthesise, evaluate and use information from a broad range of sources to effectively identify, formulate and solve engineering problems.

C2. Technical and communication skills to design complex systems and solutions in line with developments in engineering professional practice.

C3. Comprehension of the role of technology in society and identified issues in applying engineering technology ethics and impacts; economic; social; environmental and sustainability.

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<p>PE 2.3 Application of systematic synthesis and design processes.</p>	<p>PLO 3: Design and Problem Solving</p> <p>Graduates will use skills in established systematic design and project management methodologies, to source, analyse, synthesise, design and communicate projects and information [C1, C2] individually or in collaboration with others as team members and leaders.</p> <p>Graduates will also apply complex problem solving methods [C1] to steel and concrete structures as professional civil and structural engineers in a practical, independent, sustainable and ethical manner with a socially, environmentally and economically accountable ethos [C3].</p>	<p>C1. Cognitive skills to synthesise, evaluate and use information from a broad range of sources to effectively identify, formulate and solve engineering problems.</p> <p>C2. Technical and communication skills to design complex systems and solutions in line with developments in engineering professional practice.</p> <p>vComprehension of the role of technology in society and identified issues in applying engineering technology ethics and impacts; economic; social; environmental and sustainability.</p>
<p>PE 2.4 Application of systematic approaches to the conduct and management of engineering projects.</p>	<p>PLO 1: Communication</p> <p>Graduates will have communication (oral and written) skills to investigate, analyse and present technical ideas, information and solutions [A1] on Civil/Structural Engineering problems and projects in a professional, independent and organised manner, across international cultures, individually and in teams, within the professional engineering domain [A2].</p> <p>Graduates will also demonstrate professional conduct and accountability befitting Professional Engineers via industry exposure practice [A2] – integrated and consolidated within the various Civil/Structural engineering topics.</p> <p>PLO 4: Professional Conduct, Knowledge and Ethics</p> <p>Graduates of this program will have an in-depth understanding of synthesis and design in specialist bodies of knowledge [D1] at the Professional Engineering level across the civil and structural engineering disciplines including: applying fundamental civil and structural engineering principles; performing displacement analysis of statically indeterminate structures; evaluating hazard, risk and performing safety system design; assessing effects of earthquakes on buildings; performing dynamic structural analysis; and systematic project management [D2].</p> <p>Graduates will also demonstrate scientific, mathematical, design and international standards perspectives [D3] as ethical professional Civil/Structural engineers.</p> <p>PLO 5: Research</p> <p>Graduates will execute applied research projects with independent scholarship, advanced research, planning, and leadership [E1] with accountability and sound research ethos; with research principles and methods relevant to the Civil/Structural engineering domain [E2] via professional and industry exposure to practice.</p>	<p>A1. Cognitive and technical skills to investigate, analyse and organise information and ideas and to communicate those ideas clearly and fluently, in both written and spoken forms appropriate to the audience.</p> <p>A2. Ability to professionally manage oneself, teams, information and projects and engage effectively and appropriately across a diverse range of international cultures in leadership, team and individual roles.</p> <p>D1. Apply systematic synthesis and design processes within the technology domain</p> <p>D2. Apply systematic approaches to the conduct and management of projects within the technology domain</p> <p>D3. Knowledge of international perspectives in engineering and ability to apply various national and International Standards</p> <p>E1. Application of advanced research and planning skills to engineering projects</p> <p>E2. Knowledge of research principles and methods in an engineering context</p>

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Professional and Personal Attributes

EA 3.1 Ethical conduct and professional accountability.

PLO 3: Design and Problem Solving

Graduates will use skills in established systematic design and project management methodologies, to source, analyse, synthesise, design and communicate projects and information [C1, C2] individually or in collaboration with others as team members and leaders.

Graduates will also apply complex problem-solving methods [C1] to steel and concrete structures as professional civil and structural engineers in a practical, independent, sustainable and ethical manner with a socially, environmentally and economically accountable ethos [C3].

PLO 4: Professional Conduct, Knowledge and Ethics

Graduates of this program will have an in-depth understanding of synthesis and design in specialist bodies of knowledge [D1] at the Professional Engineering level across the civil and structural engineering disciplines including: applying fundamental civil and structural engineering principles; performing displacement analysis of statically indeterminate structures; evaluating hazard, risk and performing safety system design; assessing effects of earthquakes on buildings; performing dynamic structural analysis; and systematic project management [D2].

Graduates will also demonstrate scientific, mathematical, design and international standards perspectives [D3] as ethical professional Civil/Structural engineers.

C1. Cognitive skills to synthesise, evaluate and use information from a broad range of sources to effectively identify, formulate and solve engineering problems.

C2. Technical and communication skills to design complex systems and solutions in line with developments in engineering professional practice.

C3. Comprehension of the role of technology in society and identified issues in applying engineering technology ethics and impacts; economic; social; environmental and sustainability.

D1. Apply systematic synthesis and design processes within the technology domain

D2. Apply systematic approaches to the conduct and management of projects within the technology domain

D3. Knowledge of international perspectives in engineering and ability to apply various national and International Standards

EA 3.2 Effective oral and written communication in professional and lay domains.

PLO 1: Communication

Graduates will have communication (oral and written) skills to investigate, analyse and present technical ideas, information and solutions [A1] on Civil/Structural Engineering problems and projects in a professional, independent and organised manner, across international cultures, individually and in teams, within the professional engineering domain [A2].

Graduates will also demonstrate professional conduct and accountability befitting Professional Engineers via industry exposure practice [A2] – integrated and consolidated within the various Civil/Structural engineering topics.

A1. Cognitive and technical skills to investigate, analyse and organise information and ideas and to communicate those ideas clearly and fluently, in both written and spoken forms appropriate to the audience.

A2. Ability to professionally manage oneself, teams, information and projects and engage effectively and appropriately across a diverse range of international cultures in leadership, team and individual roles.

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PE 3.3 Creative, innovative and proactive demeanour.

PLO 2: Knowledge, Analysis and Judgement

Graduates of this program will be able to identify, critically analyse and creatively solve intellectually complex, specialised professional engineering problems [B1] in hydraulics, pneumatics, drives, pumps and compressors relevant to Civil/Structural Engineering, individually or in groups, underpinned by critical analysis, innovation, self-reflection, research, evaluation, synthesis, accountability, [B1, B2] and sound engineering judgement of solutions relevant to the Professional engineering domain.

B1. Ability to critically analyse and evaluate complex information and theoretical concepts.

B2. Ability to creatively, proactively and innovatively apply theoretical concepts, knowledge and approaches with a high level of accountability, in an engineering context.

PE 3.4 Professional use and management of information.

PLO 1: Communication

Graduates will have communication (oral and written) skills to investigate, analyse and present technical ideas, information and solutions [A1] on Civil/Structural Engineering problems and projects in a professional, independent and organised manner, across international cultures, individually and in teams, within the professional engineering domain [A2].

Graduates will also demonstrate professional conduct and accountability befitting Professional Engineers via industry exposure practice [A2] – integrated and consolidated within the various Civil/Structural engineering topics.

PLO 2: Knowledge, Analysis and Judgement

Graduates of this program will be able to identify, critically analyse and creatively solve intellectually complex, specialised professional engineering problems [B1] relevant to civil and structural engineering, individually or in groups, underpinned by critical analysis, innovation, self-reflection, research, evaluation, synthesis, accountability, [B1, B2] and sound engineering judgement of solutions relevant to the Professional engineering domain.

PLO 4: Professional Conduct, Knowledge and Ethics

Graduates of this program will have an in-depth understanding of synthesis and design in specialist bodies of knowledge [D1] at the Professional Engineering level across the civil and structural engineering disciplines including: applying fundamental civil and structural engineering principles; performing displacement analysis of statically indeterminate structures; evaluating hazard, risk and performing safety system design; assessing effects of earthquakes on buildings; performing dynamic structural analysis; and systematic project management [D2].

Graduates will also demonstrate scientific, mathematical, design and international standards perspectives [D3] as ethical professional Civil/Structural engineers.

A1. Cognitive and technical skills to investigate, analyse and organise information and ideas and to communicate those ideas clearly and fluently, in both written and spoken forms appropriate to the audience.

A2. Ability to professionally manage oneself, teams, information and projects and engage effectively and appropriately across a diverse range of international cultures in leadership, team and individual roles.

B1. Ability to critically analyse and evaluate complex information and theoretical concepts.

B2. Ability to creatively, proactively and innovatively apply theoretical concepts, knowledge and approaches with a high level of accountability, in an engineering context.

D1. Apply systematic synthesis and design processes within the technology domain

D2. Apply systematic approaches to the conduct and management of projects within the technology domain

D3. Knowledge of international perspectives in engineering and ability to apply various national and International Standards

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EA 3.5 Orderly management of self and professional conduct.

PLO 1: Communication

Graduates will have communication (oral and written) skills to investigate, analyse and present technical ideas, information and solutions [A1] on Civil/Structural Engineering problems and projects in a professional, independent and organised manner, across international cultures, individually and in teams, within the professional engineering domain [A2].

Graduates will also demonstrate professional conduct and accountability befitting Professional Engineers via industry exposure practice [A2] – integrated and consolidated within the various Civil/Structural engineering topics.

PLO 4: Professional Conduct, Knowledge and Ethics

Graduates of this program will have an in-depth understanding of synthesis and design in specialist bodies of knowledge [D1] at the Professional Engineering level across the Civil/Structural engineering disciplines including: systems engineering; and systematic project management [D2].

Graduates will also demonstrate scientific, mathematical, design and international standards perspectives [D3] as ethical professional Civil/Structural engineers.

A1. Cognitive and technical skills to investigate, analyse and organise information and ideas and to communicate those ideas clearly and fluently, in both written and spoken forms appropriate to the audience.

A2. Ability to professionally manage oneself, teams, information and projects and engage effectively and appropriately across a diverse range of international cultures in leadership, team and individual roles.

D1. Apply systematic synthesis and design processes within the technology domain

D2. Apply systematic approaches to the conduct and management of projects within the technology domain

D3. Knowledge of international perspectives in engineering and ability to apply various national and International Standards

EA 3.6 Effective team membership and team leadership

PLO 1: Communication

Graduates will have communication (oral and written) skills to investigate, analyse and present technical ideas, information and solutions [A1] on Civil/Structural Engineering problems and projects in a professional, independent and organised manner, across international cultures, individually and in teams, within the professional engineering domain [A2].

Graduates will also demonstrate professional conduct and accountability befitting Professional Engineers via industry exposure practice [A2] – integrated and consolidated within the various Civil/Structural engineering topics.

PLO 5: Research

Graduates will execute applied research projects with independent scholarship, advanced research, planning, and leadership [E1] with accountability and sound research ethos; with research principles and methods relevant to the Civil/ Structural engineering domain [E2] via professional and industry exposure to practice.

A1. Cognitive and technical skills to investigate, analyse and organise information and ideas and to communicate those ideas clearly and fluently, in both written and spoken forms appropriate to the audience.

A2. Ability to professionally manage oneself, teams, information and projects and engage effectively and appropriately across a diverse range of international cultures in leadership, team and individual roles.

E1. Application of advanced research and planning skills to engineering projects

E2. Knowledge of research principles and methods in an engineering context