

UNSW Engineering Education Specification

1. Program Overview

Program Title: Master of Engineering

Award Title: Master of Engineering (Civil Engineering)

Engineering Discipline: Civil Engineering

The ME Civil Engineering program meets the Engineers Australia Stage 1 Competency Standard by developing graduates with advanced technical knowledge, engineering application capabilities, and professional attributes. The curriculum integrates engineering fundamentals with specialist civil engineering applications, including structural, geotechnical, transportation, Engineering Construction and Management, and water engineering, ensuring students develop the depth of expertise required by the Stage 1 Standard. In addition, through design projects, laboratory work, team-based projects, and industry engagement, students build competencies in advanced problem-solving, sustainable practice, and project management, preparing them to contribute meaningfully to the engineering profession and society.

2. Career Alignment

The specialisation prepares graduates for clearly defined professional roles across the breadth of civil engineering by aligning its learning, research-focused assessment and industry engagement with contemporary engineering practice. It provides a direct pathway to a Professional Engineer through Engineers Australia, with curriculum design informed by industry standards, ongoing engagement with peak bodies and active participation of academic staff in professional and advisory committees. A substantial proportion of graduates progress into roles that lead to chartered status, while others enter specialised or interdisciplinary careers across infrastructure, water, transportation, geotechnical engineering, environmental systems and emerging sustainability sectors.

The specialisation equips graduates for both technical and leadership roles in consulting firms, construction contractors, government authorities, infrastructure owners, research organisations and sustainability-focused enterprises. It develops strong analytical, design and project-delivery capabilities through design-based learning, laboratory practice and industry-linked projects that replicate real engineering workflows—from problem definition and modelling through to design, evaluation, implementation and communication.

Professional preparation is embedded through the minimum 60 days of Industrial Training, which connects students with workplace expectations and engineering culture. Research literacy and innovation capability are strengthened through the final-year thesis, which is supervised and assessed with reference to professional and academic standards.

Industry integration is sustained through guest seminars, employer engagement initiatives, thesis showcases, and regular participation in careers events and professional development activities. Students gain hands-on experience with the tools shaping modern engineering practice—including

numerical modelling, data analytics, sensing technologies, design software platforms and sustainability assessment frameworks—ensuring they graduate work-ready for an evolving infrastructure landscape.

3. Specialisation Framework

Initial development of the Specialisation Learning Outcomes (SLOs) involved a working party consisting of the Specialisation Coordinators for Civil Engineering (undergraduate), Civil Engineering (postgraduate) and Civil with Architecture. The draft was then presented to the School Teaching and Learning Committee (TLC) for discussion. This discussion included student opinion collected from representatives of the Civil and Environmental Engineering Student Society (CEVSOC). After including amendments from TLC, the draft was presented to the School Management Committee (SMC) for discussion. After approval from the SMC the draft was submitted to the Industry Advisory Committee (IAC) for comment.

The final set of suggested improvements was received from the Faculty Accreditation Working Group (FAWG). The final version of the SLOs incorporated all the comments from the TLC, SMC, IAC and FAWG. The final SLOs were then resubmitted to the TLC, SMC and IAC in turn for final endorsement.

On successful completion of this specialisation, graduates will be able to:

1. Show mastery in the enabling sciences (maths, physics and materials science) that underpin Civil Engineering.
2. Demonstrate mastery in Civil Engineering specialist technical knowledge areas such as: Structural Engineering, Geotechnical Engineering, Construction Management, Transport Engineering and Water Engineering.
3. Source, critically evaluate, and apply information and current research to the solution of complex problems in Civil Engineering.
4. Select and use appropriate design, analysis and computational tools, including: structural modelling and design programs, hydraulic modelling, simulation software, laboratory procedures and analysis, Australian Standards, industry design codes, management of digital data sets and project management and control tools to analyse complex problems in Civil Engineering.
5. Design, critique and implement innovative engineering solutions and systems in Civil Engineering.
6. Lead and manage Civil Engineering projects, individually or as part of a team under a team leader, in a systematic and professional manner.
7. Apply nuanced professional judgement that contributes to the ethical and sustainable practice of Civil Engineering.
8. Communicate and present professionally and effectively in work teams, across the profession and the wider community.

The discipline-specific technical knowledge and application skills embedded in this program ensures the attainment of the Engineers Australia Stage 1 competencies through a systematic alignment of Course Learning Outcomes, Specialisation Learning outcomes, Program Learning Outcomes and EA Professional competencies Stage 1. Details of this are provided on Section 6 of this document.

4. Continuous Improvement

The Head of School and the Deputy Head (Education) have the overall responsibility for the management of the undergraduate and postgraduate coursework programs within the School. The Teaching and Learning Committee of the School consists of academic staff members, teaching support assistants, members of the undergraduate and postgraduate student societies and a representative from the student nucleus. The committee meets monthly to discuss co-ordination of teaching, program review, designing new courses and revision of existing courses, course organisation and administration, students' feedback on courses, etc. The undergraduate and postgraduate student society representatives provide a student voice and present focus group feedback each term. The committee supports the focus groups run by the societies with catering.

Proposals for new courses or course revisions relating to a particular discipline are born out of discussion among all staff in that discipline as well as relevant industry representatives. New proposals for both undergraduate and postgraduate elective courses are typically driven by discipline specific academic staff and motivated by current industry or research trends. Course changes are discussed at the TLC first and then discussed at the School level at the School Management Committee meetings.

To ensure program design is informed by ongoing evaluation of practice, industry needs, and future demand, the School draws on regular input from the Industry Advisory Committee (IAC) and engagement with Industry Partners. The School has active partnerships with industry organisations that provide regular input on current practice and workforce needs, including through engagement with academic staff and guest lectures. In addition, as Australia's top-ranked civil engineering school, many courses are taught by academics who lead internationally recognised research programs. This leadership, together with strong industry links, keeps teaching research-informed and up to date, with new methods and tools translated into course content. The School also keeps a watch on updates to relevant standards and guidelines and refreshes teaching software in computer labs through annual licensing reviews, so students can learn and use current industry-standard tools.

5. Review Process

UNSW's Academic Offering Review and Monitoring Procedure outlines a structured approach to maintaining the quality and relevance of academic programs and courses. It includes both program-level and course-level review processes, with defined responsibilities and timelines.

Program Monitoring is conducted annually for all programs and specialisations. A comprehensive program review must occur at least once every five years for accredited programs, and every seven years for others. These reviews include a self-evaluation report (SER), review panel, review event, and a formal response with an implementation plan. Oversight is provided by the Academic Board and University Academic Quality Committee (UAQC), with input from Faculty Education Committees and Deans.

Course Review within UNSW Engineering is managed through a two-tiered process: Routine Course Review and Comprehensive Course Review. Routine reviews are conducted at the end of each term by Schools, using data such as enrolment, assessment outcomes, academic integrity issues, WAM differences, and student feedback (myExperience). Courses flagged through this process are added to the Comprehensive Course Review roster.

Comprehensive Course Reviews are detailed evaluations led by the Course Convenor in collaboration with a Faculty Educational Developer, Nexus Fellow, or Senior Academic. These reviews assess course design, pedagogy, alignment with learning outcomes, and feedback mechanisms. Outcomes are documented in a Course Development Plan and an Evaluation Report following the next course delivery. Schools must review at least 10% of their courses annually.

Stakeholder involvement spans multiple levels, including the Academic Board, UAQC, Faculty and School committees, Course Convenors, and external contributors such as students and professional bodies.

Frequency of updates includes termly course reviews, annual program monitoring, and five-yearly comprehensive reviews for accredited programs.

6. Curriculum Mapping

A curriculum mapping exercise has been carried out for the CVENYS Civil Engineering specialisation of the 8621 Master of Engineering (ME) program at UNSW. The Civil Engineering specialisation provides good coverage of all the Engineers Australia Stage 1 Graduate Competencies. It is particularly strong in specialist engineering knowledge, the use of design, analysis and computation tools, and design of innovative engineering solutions and systems. Future direction for the **specialisation** involves working on embedding ethics more widely throughout the **specialisation**. The specialisation has rigorous and varied assessment tasks.

Table 1 provides the alignment mapping between the specialisation learning outcomes and the Engineers Australia Stage 1 Competencies. Table 2 provides the alignment mapping between the Specialisation Learning Outcomes and each of the Courses. Table 3 provides the alignment between each assessment to the course learning outcomes.

Analysis of **Table 2** reveals that the specialisation provides the strongest coverage in SLO 2 (specialist technical knowledge), SLO 4 (design and computational tools), and SLO 5 (design, critique and implement), with most courses showing 'Proficient' level alignment. Coverage of SLO 1 (enabling sciences) is intentionally limited as students enter with undergraduate degrees already covering these fundamentals. SLO 6 (project management) and SLO 7 (professional judgement) show more selective coverage, concentrated primarily in the core courses (CVEN9000, CVEN9050/51, CVEN9451/52/53) and management electives rather than distributed across all elective courses.

The mapping demonstrates clear progression from 'Introduced' through 'Developed' to 'Proficient' levels. For example, SLO 5 (design) shows 'Developed' level in Year 1 core courses (CVEN3303, CVEN3304), progressing to 'Proficient' in Year 2 practice projects (CVEN9050/51) and advanced electives. This staged development ensures students build capabilities.

The mapping ensures alignment among CLOs, SLOs, and PLOs within the specialisation. CLOs are created by course coordinators to support relevant SLOs while addressing the specific technical knowledge, skills, and practices expected of students. Each assessment task is clearly mapped to CLOs to ensure direct measurement of student achievement. Every course undergoes an annual review where course convenors analyse assessment results, gather student feedback, reflect on industry and societal trends and issues, and update courses if necessary. The achievement of learning outcomes is verified through analysis of assessment performance at the course level, with results then aggregated to evaluate attainment across the specialisation and program level for different student cohorts.



Table 1: Mapping of the specialisation learning outcomes to the Engineers Australia Stage 1 Competencies.

SLO/PLO	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12	PLO13	PLO14	PLO15	PLO16
1. Show mastery in the enabling sciences (maths, physics and materials science) that underpin Civil Engineering.	x	x														
2. Demonstrate mastery in Civil Engineering specialist technical knowledge areas such as: Structural Engineering, Geotechnical Engineering, Construction Management, Transport Engineering and Water Engineering.			x		x											
3. Source, critically evaluate, and apply information and current research to the solution of complex problems in Civil Engineering.				x												
4. Select and use appropriate design, analysis and computational tools, including: structural modelling and design programs, hydraulic modelling, simulation software, laboratory procedures and analysis, Australian Standards, industry design codes, management of digital data sets and project management and control tools to analyse complex problems in Civil Engineering.					x		x	x						x		
5. Design, critique and implement innovative engineering solutions and systems in Civil Engineering.									x				x			
6. Lead and manage Civil Engineering projects, individually or as part of a team under a team leader, in a systematic and professional manner.										x				x		x
7. Apply nuanced professional judgement that contributes to the ethical and sustainable practice of Civil Engineering.					x	x					x				x	
8. Communicate and present professionally and effectively in work teams, across the profession and the wider community.												x				x

Table 2: Mapping of courses to the specialisation learning outcomes.

Course code	1. Show mastery in the enabling sciences (maths, physics and materials science) that underpin Civil Engineering.	2. Demonstrate mastery in Civil Engineering specialist technical knowledge areas such as: Structural Engineering, Geotechnical Engineering, Construction Management, Transport Engineering and Water Engineering.	3. Source, critically evaluate, and apply information and current research to the solution of complex problems in Civil Engineering.	4. Select and use appropriate design, analysis and computational tools, including: structural modelling and design programs, hydraulic modelling, simulation software, laboratory procedures and analysis, Australian Standards, industry design codes, managem	5. Design, critique and implement innovative engineering solutions and systems in Civil Engineering.	6. Lead and manage Civil Engineering projects, individually or as part of a team under a team leader, in a systematic and professional manner.	7. Apply nuanced professional judgement that contributes to the ethical and sustainable practice of Civil Engineering.	8. Communicate and present professionally and effectively in work teams, across the profession and the wider community.
Research Project								
CVEN9000	no alignment	Proficient	Developed	Introduced	Proficient	Developed	Introduced	Developed
CVEN9050	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient
CVEN9051	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient
CVEN9451	Proficient	Proficient	Proficient	Proficient	Proficient	no alignment	Proficient	Proficient
CVEN9452	Proficient	Proficient	Proficient	Proficient	Proficient	no alignment	Proficient	Proficient
CVEN9453	Proficient	Proficient	Proficient	Proficient	Proficient	no alignment	Proficient	Proficient

GMAT4220	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient
Level 5 Electives								
CVEN9405	Proficient	Proficient	Proficient	Developed	Developed	Developed	Introduced	Proficient
CVEN9407	Proficient	Proficient	Developed	Proficient	Developed	Introduced	Introduced	Developed
CVEN9415	no alignment	Developed	Developed	Developed	Developed	Developed	Developed	Developed
CVEN9421	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient
CVEN9422	Proficient	Proficient	Proficient	Proficient	Proficient	no alignment	Developed	no alignment
CVEN9510	Proficient	Proficient	Proficient	Proficient	Proficient	no alignment	no alignment	Proficient
CVEN9511	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient	no alignment	Proficient
CVEN9512	no alignment	Proficient	Proficient	Proficient	Proficient	no alignment	Developed	no alignment
CVEN9513	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient
CVEN9521	Proficient	Proficient	Proficient	Proficient	Proficient	no alignment	Proficient	Proficient
CVEN9522	Proficient	Proficient	Proficient	Proficient	Proficient	no alignment	Proficient	Proficient
CVEN9524	Proficient	Proficient	Proficient	Proficient	Proficient	no alignment	Proficient	Proficient
CVEN9526	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient	Developed	Proficient
CVEN9531	no alignment	Proficient	Proficient	Proficient	Proficient	no alignment	Developed	Introduced
CVEN9611	Developed	Proficient	Proficient	Proficient	Proficient	Developed	Proficient	Proficient
CVEN9612	Proficient	Proficient	Proficient	Proficient	Proficient	no alignment	Developed	Developed
CVEN9620	Proficient	Proficient	Proficient	Proficient	Proficient	Developed	Proficient	Proficient
CVEN9630	Developed	Developed	Developed	Developed	no alignment	no alignment	no alignment	Introduced
CVEN9640	Introduced	Introduced	Developed	Developed	Developed	no alignment	Developed	Developed
CVEN9701	no alignment	Proficient	no alignment	Introduced	Proficient	Proficient	Proficient	no alignment
CVEN9702	no alignment	Proficient	no alignment	Developed	Proficient	Proficient	Proficient	Proficient
CVEN9710	no alignment	Proficient	Developed	Introduced	Introduced	Proficient	Proficient	no alignment
CVEN9723	no alignment	Proficient	Proficient	Proficient	Proficient	Developed	Developed	Proficient
CVEN9731	Proficient	Proficient	Developed	Developed	no alignment	Proficient	Introduced	no alignment
CVEN9802	Proficient	Proficient	Proficient	Proficient	no alignment	no alignment	no alignment	Developed
CVEN9806	no alignment	Proficient	Proficient	Proficient	Proficient	no alignment	no alignment	no alignment
CVEN9809	Proficient	Proficient	Proficient	Proficient	Proficient	no alignment	no alignment	Developed
CVEN9818	Proficient	Proficient	Proficient	Proficient	Proficient	no alignment	Proficient	no alignment
CVEN9820	Proficient	Proficient	Proficient	Proficient	no alignment	no alignment	no alignment	Developed
CVEN9822	Developed	Proficient	Introduced	Proficient	Proficient	no alignment	Introduced	Introduced

CVEN9824	Developed	Developed	Proficient	Proficient	Developed	no alignment	Developed	no alignment
CVEN9826	Proficient	Proficient	Proficient	Proficient	Proficient	Developed	Developed	Proficient
CVEN9840	Developed	Proficient	Proficient	Proficient	Proficient	Developed	Introduced	Developed
CVEN9855	Developed	Developed	Developed	Developed	no alignment	no alignment	Developed	no alignment
CVEN9856	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient
CVEN9857	Proficient	Proficient	Proficient	Proficient	Developed	Developed	Developed	Proficient
CVEN9872	Developed	Proficient	Developed	Proficient	Proficient	Proficient	Developed	Proficient
CVEN9881	Developed	Developed	Proficient	Proficient	Proficient	Proficient	Proficient	Proficient
GMAT9600	Developed	Developed	Introduced	Introduced	Developed	no alignment	no alignment	no alignment
GMAT9606								

7. Assessments

A complete overview of the assessment types is provided in Figures 1-3. Figure 1 shows assessment distribution for all specialisation courses, while Figures 2 and 3 show assessment distribution for core and elective courses, respectively.

This assessment distribution reveals distinct approaches between core and elective courses. Core courses (Figure 2) emphasise reports (23.08%), project-based assessment (15.38%), alongside traditional examination (26.92% combined test and examination components). This assessment distribution reflects the presence of core courses on civil engineering (mostly evaluated via exam and report-based courses) as well as design and project core courses (which are project-based assessed).

In contrast, elective courses (Figure 3) have a higher examination component (45.98% combined test and exam components) to ensure depth of specialist technical knowledge, with assignments (36.16%) used to apply this knowledge to discipline-specific problems.

The enquiry-based courses, i.e. Design Practice and Practice Project courses, revolve around a major work, with draft sections of these works assessed as the course progresses to give the students formative feedback. Assessments such as video presentations and interviews are also used to improve student communication skills and increase academic integrity.

Reflective Practice and Critical Review are embedded particularly in project-based and report-writing tasks, where students are encouraged to evaluate their learning processes, decision-making, and outcomes. Courses incorporate structured opportunities for self and peer assessment, especially in group projects and presentations, to cultivate professional judgement and collaborative skills.

The School has implemented many processes to ensure that academic integrity is maintained:

- All exam papers are reviewed by another academic. The reviewer is also provided with the rubric and worked solution. When a paper is written by a new academic, it will be reviewed by a professor or an Associate Professor to ensure standards are being maintained. Admin staff follow up to ensure all papers have been reviewed.
- Reports are submitted via Turnitin to help detect plagiarism and collusion.
- Academics provide rubrics and worked solutions to markers. The academic then remarks a sample of the reports or exam papers to ensure the rubric is being used correctly.
- Important works, such as Masters Projects (CVEN9451/52/53 and CVEN9050/51), will have two examiners to ensure consistency.
- The School has invested heavily in online assessment platforms, such as Inspira and STACK, that enable advanced computational questions and allow programming of mathematical models that can be individualised through randomisation of input values. Since the programming is time-intensive, the School has employed a team of programmers to code the questions as specified in detail by the academics.
- The School allows the use of generative AI in coursework only to the extent explicitly stated in each assessment's instructions. Where AI is allowed (e.g., limited planning or ideation, or language

polishing), students must transparently acknowledge and reference any AI assistance. Assessment design prioritises authentic evidence of individual learning, so some assessments, including invigilated exams and quizzes as well as presentations, prohibit AI entirely, while others may allow constrained use with proper attribution. These policies align with UNSW's AI teaching guidelines and assessment guidance for ethical, responsible use. (For details on UNSW AI guidelines see <https://www.teaching.unsw.edu.au/ai/guidelines>)

CIVIL ENGINEERING (8621)

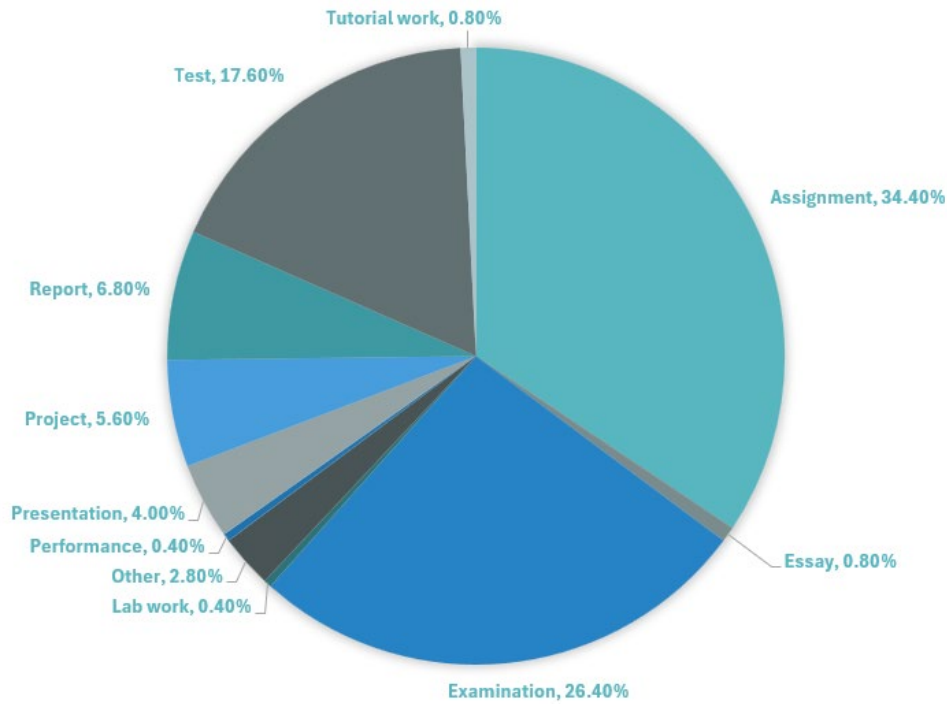


Figure 1: Percentage of assessment types used within the specialisation.

**CIVIL ENGINEERING (8621)
CORE**

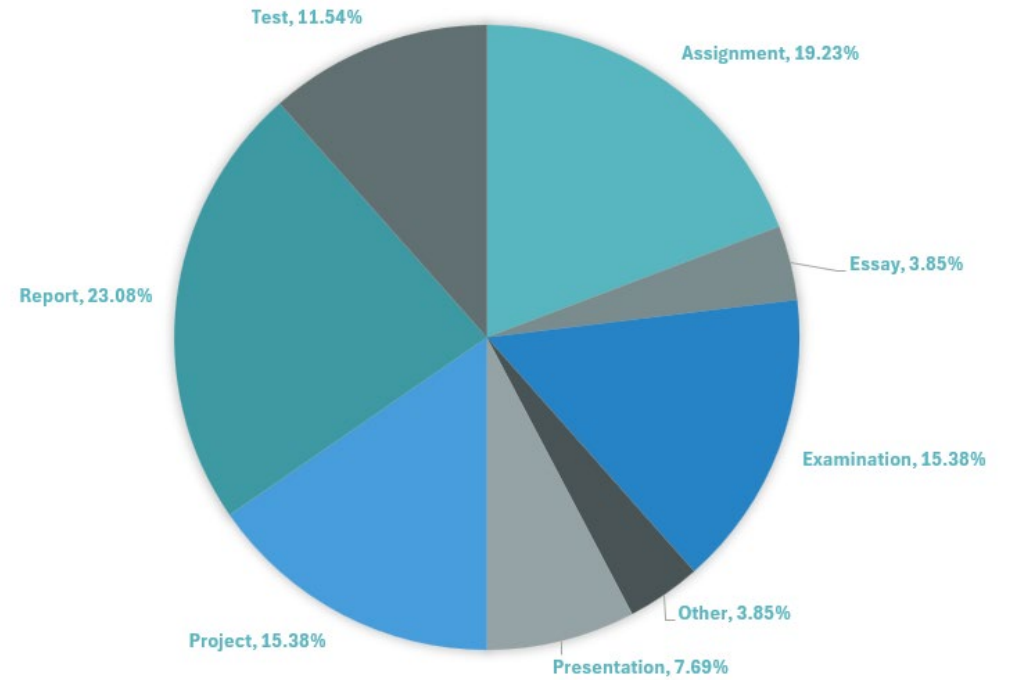


Figure 2: Percentage of assessment types used within the core of the specialisation.

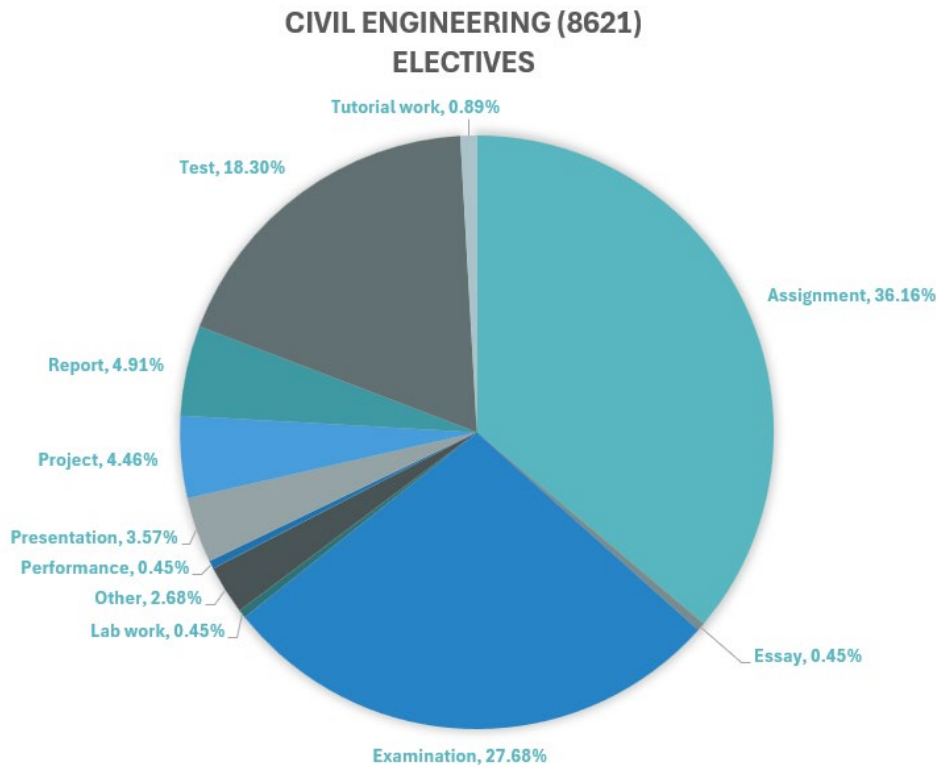


Figure 3: Percentage of assessment types used within the electives of the specialisation.

8. Specialisation Progression Plan

The structure of the CVENYS specialisation ensures that graduate-level capabilities are developed through engineering technical knowledge in Year 1, and specialised knowledge in Structural Engineering, Geotechnical Engineering, Engineering Construction and Management, Transport Engineering, and Water Engineering in Year 2. This approach allows students to reflect on their learning, enabling them to self-assess and develop graduate capabilities aligned with their interests or career aspirations.

To this end, students are supported in monitoring and adjusting their study progress through UNSW's official advising channels. Program information and enrolment support are provided through The Nucleus: Student Hub. Specialisation-specific level support is provided by designated year advisors who are appointed by the School. A study plan specific to each term entry and a progression checklist is provided to the student. In addition, the myPlan online tool combines the study plans progression checklist into a single interactive tool that allows students and staff to plan courses, view prerequisites, and track progress toward graduation in real time.

Each term, students use myPlan to confirm which requirements they have completed, which remain, and which prerequisite sequences apply, which supports self-checking of readiness for later-stage courses and informed elective selection. This is reinforced by term-by-term communications from the specialisation coordinator and by course coordinators clarifying how courses link across the program,

which helps students to reflect on their results and feedback against course learning outcomes and graduate capabilities and to adjust their plan where needed.

Students can track their progression through the “myPlan” checker tool.

[myPlan | Current Students - UNSW Sydney](#)

A progression checklist and/or study plan is also available for students for the single degree and the double degree offerings.

[Progression checksheets & study plans | Engineering - UNSW Sydney](#)