

Assessment Guide - Capstone Project

ENGN4221 Systems Engineering Project

Semester 2, 2021



Australian
National
University

v2021.S2

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1 Assessment Guide

ENGN4221 Systems Project

In Capstone Project you will practice an authentic project evaluation process.

The following table summarises the assessment activities in Capstone Project.

Table 1: Assessment activities in Capstone Project

Task	Submission	Weight
Project Audits and Reviews x 3	Group, via Repository link on Wattle	75%
Professional Reflection	Individual, via TurnItIn on Wattle	25%

1.1 Audit timelines

Each Audit Week will run through the same cycle. Audit weeks are: **Week 3 (lightweight), 6 and 10.**

Table 2: Submission timelines for Project Audits

When	Description	Who
Audit wk, Mon 09:00,	Landing page up to date	project team (group)
Audit wk, Mon 09:00,	Project Review and submissions open	self, shadows, tutors (individual)
Audit wk tutorials	Open-format presentation of your progress	project team (group)
Audit wk, Fri 17:00,	Project Review submissions closes	self, shadows, tutors (individual)
Audit wk+1, Wed 09:00,	Project Review feedback available	via Wattle
Audit wk+1 tutorials	Audit progress indication available	via Wattle
Audit wk+1 tutorials	Team's plan acting on feedback (<i>not required for PA3</i>)	project team (group)

1.2 Non-Audit timelines

Table 3: Submission timelines for other activities

When	Description	Who
Week 7 tutorials	Finalise the Professional Reflection option	with your tutor/Wattle
Week 10 Wed 17:00,	Project Showcase Poster due	project team (group)

When	Description	Who
Week 11 Friday 16:00-17:30,	Project Showcase	project team (group)
Week 12 Fri 17:00,	Final Team Review and Final Project Review due	project team (group)
Week "13" Mon 09:00,	Professional Reflection due	individual

2 Project Audits (PA)

Project Audits are used to evaluate the progress of each team

2.1 Purpose

Project Audits are designed to provide formative feedback to guide your group towards your team's project goals whilst ensuring high-quality systems-level project governance. Project Audits are standard practice in many industries to evaluate the progress of a project.

2.2 Goal

To enhance all project work through constructive, actionable feedback with critical and considered review.

2.3 Overview

There are three Project Audit stages during the project:

- **Audit 1** (Lightweight, Concept of Operations) - to set the agenda and scope for the project
- **Audit 2** (Mid-term Project Audit) - to guide and evaluate progress, based on the project scope
- **Audit 3** (Final Project Audit) - to finalise and prepare for the next stage of the project

The Project Audit contains three activities:

- **Repository, work product and activities** - the work done and governance of your project
- **Project Review** - a self-reflection and a critique of your shadow team's work against two criteria
- **Team member contribution** - an evaluation of the relative contributions of your team

The Project Audit processes are awarded progress indicators (not grades) which can be used as evidence for your final grade prepared in your **Final Team Review**.

The [Systems Engineering Body of Knowledge \(SEBoK\)](#) (Chapter 10, 2.3) provides a good overview of why Project Audits and Reviews improve the technical aspects of projects.

2.4 Requirements

Each project will be different, and the scope, approach, deliverables—every aspect—of the project should be negotiated with your client and teaching team. At each Project Audit, you should present a

“Landing Page” within your repository. The Landing Page is a web page, file or other document that guides the reviewers through the team’s work.

2.4.1 Project Audit 1 requirements

The Concept of Operations (ConOps) is used to explicitly state your objectives for the semester. It is a standard part of the technical processes of systems engineering projects, and will be used to define your project. It should contain appropriate information to define the program of work your team will undertake to complete the project.

The ConOps should help you establish your repository, but is likely to be a standalone reference document. The document can contain links to parts of your repository that contain the full information. As a guide, it should contain a short statement sufficient to understand the nature of the work against the following areas:

- the overall project vision, goal, purpose or objective (2-3 sentences)
- what the project will achieve (2-3 sentences)
- the key stakeholders, what do they do, and how they interact (dot points)
- identification of resources, risks, potential costs and who will bear them (tables)
 - this includes an indicative financial budget (table)
- technical and other constraints (for example, reliability, security, safety)
- completion of Non-Disclosure Agreement and any Intellectual Property concerns (forms)
- the setup of tooling for development, management of tasks, and a link to the project repository (link)
- milestones for each Project Audit, including:
 - a set of goals and deliverables for each audit (2-3 sentences)
 - contingencies, such as stretch or crash goals for the milestone (2-3 sentences)
 - a timeline for the project to reach the milestone (weekly table)
 - a work breakdown structure for the milestone (as designed)

It is highly recommended that you get sign-off for your ConOps from your client, tutor and all team members. Any variation to the ConOps during semester would normally require sign-off by all stakeholders. There is no template for this sign-off, but it should most likely resemble a “contract”-style arrangement with the names, signatures and dates of all stakeholders.

2.4.2 Project Audit 2 requirements

Audit 2 is mid-way through your project. You should be progressing the project, and should be able to report on the milestones you planned in the ConOps. Your review will be explicitly against the expectations set out in your ConOps. Audit 2 should include information navigable from your Landing Page:

- all work done, up to date, accessible and navigable within your repository
- baseline systems engineering governance: a requirements analysis, functional analysis and system architecture for your design.
- technical artefacts: initial prototypes or drafts of project outputs
- progress against each criterion

Any updates your ConOps should be undertaken for approval for work by Client, Tutor and Team Members between Audits.

2.4.3 Project Audit 3 Requirements

Audit 3 is your opportunity to demonstrate your final deliverables. Your project should be wrapping up, but you may be permitted to explain why your project is not complete by the start of the audit due to project timelines. Your review will be explicitly against the expectations set out in your revised ConOps. In addition to the Audit 2 requirements, Audit 3 should include information navigable from your landing page:

- project poster submission and team participation at the project showcase (information below)
- handover documentation back to the client or to the next project team

2.5 Project Repository

Each team is free to make their own decisions regarding the tools they use and where they store and manage the artefacts they produce. However, in making these decisions, each team should:

Consult with your client with NDA considerations in place, who needs to access to what, client's existing enterprise repository, how access will be managed and who will cover any costs

Access in addition to any client access requirements, your repository should be accessible by your shadows, tutor and course convener.

Transition arrangements consider the needs of the next project team or your client. For example, you need to ensure that they will have access to, and control over, any tools you have used.

Many groups opt to use the ANU's licence of [OneDrive](#) as the default repository system.

2.5.1 Audit Landing Page

Each team must submit or update a valid link to their Audit Landing Page via Wattle. One submission per group required.

- the Audit Landing Page should not contain any of your actual project work - this will already be stored in the tools and repositories you have been using
- if applicable, the landing page should provide instructions on how to gain access to the repositories and tools you are using (for example, how to get accounts, passwords et cetera.)

Remember that an Audit is a look at your progress at a specific point in time, and does not require you to do any additional project work just for the Audit. The landing page should be within your repository.

2.6 Showcase Poster

At the Showcase, teams will present their work to an audience including clients, academics and other students. The purpose of the poster is to clearly explain to a lay audience what your project is about. The poster will be set up on a pinboard. You may bring props, prototypes, demonstrations or other material to showcase your work, and will be given a table, shown below.

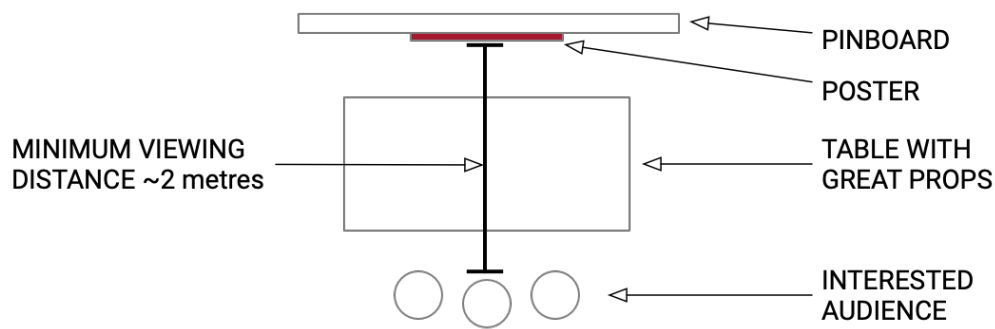


Figure 1: Aerial view of layout for poster showcase

Poster specifications

- your posters will be printed for you at A1 size on premium paper; however, your poster should be designed in such a way that it could be printed at A2 (smaller) or A0 (larger) size.
- there is **no template** that you should follow
- posters should be submitted in PDF format on Wattle, the Friday before the Showcase
- all posters should include the names of team members
- any logos or recognition from your client (including their names) should be endorsed by your client

Poster recommendations

- think of your poster as a “conversation starter” - it does not have to contain every morsel of information about your project
- avoid **bitmap formats** such as JPG, PNG, TIFF, and prefer **scalable artwork**, such as SVG
- where bitmap formats are used, the resolution should be high enough for printing (above 150 dpi at A1 size)
- avoid semi-transparent backgrounds - these might look great on the screen, but generally don't print very well
- maximise your poster for readability - with a minimum viewing distance of 2 metres, choose easily readable fonts. We suggest using a readable sans-serif font such as **Helvetica** or **Roboto**, and setting your minimum font size at 24pt (yes, this is large and you won't be able to fit your whole repository on your poster...) **The ANU colour palette will keep it in theme.**
- some groups use a **QR code** to allow your audience to explore information later
- get feedback on your poster as you go - don't save getting feedback until you've “finished”

After the showcase, posters can be given to clients or you might wish to take it home and hang it on your wall :)

Posters from previous semesters can be accessed on Wattle.

2.7 Grading

The awarding of a final group and individual grade will be negotiated over the course of the semester. Project Audit activities feed into the Final Team Review, from which your final grade will be determined in considered congress with tutors and conveners. The information in this section describes the formal process for this evaluation.

2.7.1 Progress Indicators

Projects will work at a different difficulty and quality levels. Harder projects may see less progress, easier projects might be difficult to extend. Projects will not be “punished” or “promoted” because of this “difficulty level” - instead, we will look at everything holistically and make the best judgements possible given the evidence we see. No grades will be awarded during the Project Audits, allowing time for the best teams to experiment, hopefully fail, and most importantly learn. Instead, an indication of progress will be given back to the team after each audit, based on the marking criteria.

The outcome of an audit will be based on the INCOSE guidance (modified to make sense in an educational setting) for milestones in the table below.

Table 4: Progress indicators awarded at each Project Audit

Indication	Description	Indicative grade band
Unsalvageable	Terminate or restructure the project	Fail
Unacceptable	Do not proceed—continue this stage and repeat the review when ready	Fail-Pass
Baseline - Acceptable with reservation	Proceed and respond to feedback items	Pass-Credit
Acceptable without reservation	Proceed with the next stage of the project	Credit-Distinction
Exemplary	Outstanding, systems-level activity	Distinction-HD

When awarded, these indicators are not fixed in stone - a better analogy might be “fixed in honey”. Your team may have an unacceptable early review, and turn the project around, and still do well. As a guide, the ratio of consideration for Project Audits is 1:2:3, but each circumstance will be different. These progress indicators will help to benchmark your final grade. Teams are expected to be fully autonomous in their benchmarking, so these indicators should provide one data point among others that you might be collecting.

Note: it is our experience that the vast majority of teams naturally operate at or just above the “Baseline” level. Work above this requires significant technical mastery coupled with extraordinary application of systems engineering, as described in the marking criteria below. ***It is hard work!***

2.7.2 Audit Progress criteria

Progress indicators for this assessment task will be determined using the Many Eyes Process. When evaluating a team against the following criteria, it is important to recognise that every team is different. This means that the factors considered under each criteria will differ. The audit process is designed to encourage teams to discuss and reach consensus as to what factors are appropriate at each stage of the project.

Project Outputs [superficial <-> substantial]

How valuable are the team's outputs to key stakeholders, given the level of effort and other resources available to the team?

- **Baseline** MVP/proof of concept given to clients, tested by team and other internal stakeholders, benchmarked outputs against requirements, technically rigorous solutions
- **Acceptable** outputs endorsed by client, prototypes, development, user testing, design validated against requirements, presentation back to the client organisation
- **Exemplary** system-level solutions, real-world user testing and validation, iterated prototypes, technically rigorous design, commercialisation, research papers accepted for publication, grant funding, externally validated reports, work validated by experts, evolved solutions, conference presentation

Decision Making [disorganised <-> clearly traceable]

How are the team's processes for making, implementing, evaluating and learning from decisions?

- **Baseline:** recording decisions, maintaining a decision-log, coherent and accurate meeting minutes, transparent communications, centralised communication, document revisions, [requirements meet INCOSE guide for writing requirements](#)
- **Acceptable:** broad stakeholder engagement, systematic version control, alignment with ISO/ANSI standards, industry-aligned processes, pro-active engagement with externals, invoking model-based systems engineering (MBSE) to manage projects
- **Exemplary:** inclusive decision-making processes, certification against standards, evolutionary decision systems, seeking advisory boards and reference groups, traceable MBSE

Teamwork [non-functioning <-> peak performance]

How is the team working together to achieve project outcomes?

- **Baseline:** designated specialist roles, rotating functional roles, team position descriptions, sorting out differences, learning from failure
- **Acceptable:** engagement with mentors, embracing diverse skill-sets, building opportunities for personal development, embracing lessons from failure, reducing uncertainty, building support teams around the project
- **Exemplary:** evolutionary roles, engagement with experts from specialist fields, transcending disciplinary boundaries, supporting to develop new skills with other team members

Communication [unclear <-> clear]

How is the team communicating with, and managing the expectations of key stakeholders?

- **Baseline:** transparent, relevant, timely, professional, respectful, effective, using a systems vocabulary, navigable
- **Acceptable:** systematic processes, facilitated communication between team and stakeholders, strategic communication to stakeholders, modelling of professional communication, active listening

- **Exemplary:** building a shared vision, trust between all stakeholders, common mental models of practice, communicating and listening with outside audiences, empowering members to engage with new audiences

Reflection [ignorant <-> transformative]

note: not considered formally in PA1. *How is the team reviewing feedback and acting on it to improve their performance?*

- **Baseline:** acting on feedback, incorporating systematic reflection, respecting diverse viewpoints
- **Acceptable:** establishing external benchmarking processes, deliberate seeking of mentoring
- **Exemplary:** constructing processes to gain external validation, additional review processes including external stakeholders, helping other teams to reflect and improve

Design Visualisation [not effective <-> highly effective]

note: only considered for the poster in PA3 *How is your project visualised and communicated at the Showcase?*

- **Baseline:** states the problem and scope, reports outcomes and results, shows how the project has delivered value, demonstrates individual contributions, recognises stakeholders, visually coherent, uncluttered, supplemented by prototypes
- **Acceptable:** builds a narrative, presents prototypes, representative of work completed, appeals to a broad audience, leads to opportunities for new audiences
- **Exemplary:** involves physical and virtual representation, enables further opportunities and understanding, acts on opportunities for new audiences

2.7.3 Project Audit grade: Team Review component (group)

The final grade for the group will be determined through application prepared by the team. Each team will provide an application detailing the team's performance against each criterion.

- 3 pages (maximum) detailing performance against each of the six criteria with reference to indicators
- 2 pages of specific supporting evidence
- a coherent grade band recommendation based on the **Progress Indicators**.

This will be considered alongside the progress indicators for each of the audits and, of course, the project repository and deliverables. You should develop this application in deep consultation with your tutor over the whole semester. If this process is done well, you will have a clear idea of your group's grade ahead of submission. There is little value to the team by overstating or overshooting.

2.7.4 Project Audit: Team member contribution (TMC) weighting (individual)

During the Project Review process, each team member will evaluate the relative contributions of each team member. Students will self-evaluate, but this self-evaluation will be muted in the consideration of the weighting. Contributions will be awarded a weighting on a 5-point scale:

Table 5: Indicative weightings for Team Member Contribution

Label	Description	Indicative weighting
Absent	Absent from project work without notice	Case-by-case
Well below expectations	Team member is not completing tasks	-5%
Below expectations	Team member could be contributing more	-2%
At expectations	Consistently contributing to the team	0%
Above expectations	Team member is doing more than was requested	+2%
Well above expectations	Team member is significantly lifting the team	Case-by-case

Note: No late submissions for TMCs are accepted. Nil submissions will attract a 5% penalty.

A TMC will be awarded for each Project Audit, and the result will be cumulative over the three Project Audits. TMCs will be awarded in consultation with your tutor, and based on the reviews given through the TMC process. It is not common practice to award high numbers of positively cumulative TMCs primarily because great leaders should be enabling other members of their team and improving the quality of project work (not seeking individual advantage).

Many students rate their whole team “well above expectations”. This makes no difference to your TMC - what we are examining is the difference in the median reviews of team members. This actually just tells the teaching team that you don’t understand the purpose of this process (nor do you understand the primary-school-level concept of averages).

2.7.5 Project Audit: Review weighting (individual)

At each Audit, each team member will be required to reflect on two criteria from your project work, and the same criteria of your shadow team’s project work. Criteria will be randomly allocated, and you will be notified which criteria you are responsible for at the start of the Audit Week through the Project Review form.

You will complete a Project Review form with a series of indicators, and a written component of 250-500 words for each team’s review. This will involve meaningful investigation and critique into the work of the team. The reviews should add value to both teams. Completing the review is considered as service in your role as a member of the class. Your tutor will award a weighting based on a 3-point scale:

Table 6: Indicative weightings for Project Review

Label	Description	Indicative weighting
Nil submission	No submission by due date (late submissions not accepted)	-5%
Below expectations	Feedback not actionable, constructive or accurate	between -2% and -5%
At expectations	Feedback actionable, constructive and accurate	0%
Above expectations	Systematically driving behaviour through feedback	+2% or determined by case-by-case

The Project Review weightings will be awarded for each review. It is not common to award high numbers of positively cumulative PR weightings, but there have been many extraordinary examples of students significantly improving the work of others through review.

2.7.6 Determination of final audit grade

Your final individual weighting will be calculated through the following formula:

your group's project audit grade (based on Team Review submission)
 \times (team member contribution (PA1+PA2+PA3) + project reviews (PA1+PA2+PA3))

For example, a team member might receive the following weightings during reviews:

Table 7: Example individual grade calculation

Project Audit	Team Member Contribution	Project Review	Cumulative weighting
PA1	At expectations; 0%	At expectations; 0%	1 (100%)
PA2	Below expectations; -2%	Nil submission; -5%	0.93 (93%)
PA3	Above expectations; 2%	At expectation; 0%	0.95 (95%)

Example

Let us assume that the team has had progress indicators throughout the semester in line with "Baseline" and "Acceptable with reservation" progress indicators, and successfully argue a Credit-Distinction grade in the Team Review. The Project is awarded a 67.5%. Therefore, the individual grade would be calculated as:

Project grade (67.5%) \times Individual Weighting (0.95) = 64.125%

Another team member with an IW of 1.1 due to exemplary Project Reviews and TMC would be calculated as:

Project grade (67.5%) x Individual Weighting (1.1) = 74.25%

3 Professional Portfolio (PP)

The Professional Reflection is an independent activity that supplements your ongoing professional engineering development

3.1 Purpose

To reflect on your learning in the Capstone Project as a launching point for the next part of your career.

3.2 Goal

To help you get your foot in the door to your next big opportunity!

3.3 Options

There are six options for the presentation of the Professional Reflection, and you should pick an option that is going to add value to your career.

- **Application Package** option - *a response to an opportunity (job, scholarship, et cetera), building on your experience in this course*
- **Professional Reflection or Portfolio** option - *a final reflection on your learning in relation to the criteria*
- **Technical Leadership Program** option - *this program involves sessions over the semester run in the workshop time, by application only*
- **CPEng Gap Analysis** option - *a gap analysis of activities and plan to achieve CPEng in the next 5 years, in relation to the criteria*
- **Engineering Logbook** option - *a logbook of activity and thoughts throughout the project*
- **Continuing Professional Development** option - *attendance in a program of professional development over the course of the semester*
- **Professional Accreditation** option - *use this opportunity to develop your application for the Grand Challenge Scholar Program, Associate Fellowship of the Higher Education Academy or Associate Systems Engineering Professional accreditation*

It is highly likely that you will get the most value out of this activity through developing a hybrid of these activities **in consultation with your tutor prior to week 7**.

The Professional Reflection should build primarily around your experience in this course, but may be supplemented with relevant recent experiences, such as previous projects or professional development that lead into your project.

3.4 Requirements for all options

The format for your Professional Portfolio is flexible, but must satisfy these minimum requirements:

- the content presented should be able to be consumed in 10 minutes
- the reflection should be based around your professional development in relation to this course (though, drawing connections to other courses is valuable)

- contain the equivalent of two pages of supplementary work material (pictures of actual work done, such as CAD drawing, schedules, sample code, photos) supporting your application

3.4.1 Application Package option

This is an application for a real job or position of any kind, built with significant reflection of your experience in Capstone Project. This could be an application for:

- graduate employment, or a promotion in your current position
- an industry or social internship
- an postgraduate program, or other scholarship program
- a relevant award
- a start-up program or accelerator

You are responsible for finding a relevant job/internship/program/award advertisement to respond to. The deadlines for the advertisement may not align with the assessment due dates, and you may not choose to submit your actual application, but it should be a real advertisement. The recommended submission components for this option include:

- A cover letter (1-page)
- A statement addressing the selection criteria (typically 200-250 words per criterion)
- A brief CV or Linked.in profile (typically 2 curated pages)
- Approx. 2 pages of relevant work product

If you are applying for postgraduate study, follow the guidelines given by the university as a starting point. The four domains of the [Vitae Researcher Development Framework](#) is an excellent platform to use as criteria for reflection.

If there is no specific indication, then use the above guidelines **in consultation with your tutor prior to week 7**.

3.4.2 Professional Reflection or Portfolio option

This option is less structured than the WPP option, and allows you to explore your experience in the project and “look back” on it from your personal perspective. It might be a critical review, or a more creative piece. You probably should use the first person. Some guidance includes:

- think about what you know now that you didn't know before (what did you learn?).
- What did you expect to get out of the project, and was this realised? Why? Why not?
- How does what you experience map to Engineers Australia Stage 1 competencies?
- A reflection of your experience and what you might do next time.
- A letter to a future student or your future self.
- Any other questions you might want to explore in consultation with your tutor.

Because this format is such an open option, you should develop your ideas **in consultation with your tutor prior to week 7**. This option also could be used to support and enhance other options, and should be part of activities from early in semester.

3.4.3 Technical Leadership Program (TLP) option

This is a program open to 1-2 team members from each team, by application. During specified workshop sessions, a program of Technical Leadership will be run. These sessions will help you to think about your team's project processes at a higher level. This could include:

- a record of reflections about the team progress and your role in elevating it.
- A series of reporting or dashboarding about the project progress.
- Evidence of leadership ideas confirmed by review processes.
- A way to trace leadership ideas through to realisation.

It is likely that members of the TLP will build up a series of reflections about leadership, but the actual artefact that is submitted may be different, and resemble any of the other options. Members of the TLP are free to submit their PP in any format.

If there is no specific indication, then use the above guidelines **in consultation with your tutor or TLP convener prior to week 7**.

3.4.4 Engineering Logbook option

This option is a progressive and cumulative demonstration of work done over the semester. It can also be described as a "technical diary". This is practice often used in industry and research, and usually serves as evidence for:

- a time log accounting for how the client "will be billed"
- a log of activities that were undertaken on the project
- a record of ideas during the project
- evidence of inventorship or origination of ideas
- a record of designs and innovation during the project
- a way to trace an idea through to realisation

If you are thinking of using this option, you should develop your ideas **in consultation with your tutor prior to week 7**. This option also could be used to support and enhance other options, and should be part of activities from the start of semester.

3.4.5 Chartered Professional Engineer (CPEng) Gap Analysis option

When you graduate from the BEng, you will have achieved a qualification that meets the Engineers Australia Stage 1 Competencies. To achieve Chartered Status as practicing engineer, you need to demonstrate evidence against 16 Elements in the [Stage 2 Competencies](#). This is usually completed after you have had significant experience as an engineer.

As part of preparing for your career as an engineering professional, undertake the Engineers Australia Self-Assessment for [chartered status](#). Once you have completed this, undertake a gap analysis, build a plan for the next five years, or reflect on areas you plan to develop. Present the appropriate activities for you as a coherent whole as evidence for submission.

If you are thinking of using this option, you should develop your ideas **in consultation with your tutor prior to week 7**. Ideas in other options could be used to support your application in this option.

3.4.6 Continuing Professional Development option

This option is an opportunity to develop a commitment to life-long learning. This is a great way to network and learn outside of your course. The submitted artefact could be a reflection and/or diary of CPD undertaken. As a guide, professional development should:

- be a part of a coherent plan, rather than on ad-hoc, opportunistic topics
- be new activities that you would not be engaging otherwise (for example, if you are a part of a student group, participation in that group is not considered as a new activity. If you went on specific training as part of that role, this would be acceptable)
- be related to your personal development

These opportunities could include academic and professional talks, networking events such as [First Wednesday connects](#), and ongoing training such as participation in [InnovationACT](#).

As a further guide, you could explore the guidance provided by [Engineers Australia on Continuing Professional Development](#)

If you are thinking of using this option, you should develop your ideas **in consultation with your tutor prior to week 7**. This option also could be used to support and enhance other options, and should be part of activities from the start of semester.

3.4.7 Professional Accreditation option

This option is reserved for students who are preparing an application for professional accreditation.

This could be (but not limited to):

- [Grand Challenge Scholar Program \(National Academy of Engineering\)](#)
- [Associate Fellow of the Higher Education Academy](#)
- [Associate Systems Engineering Professional \(INCOSE\)](#)

If you are thinking of using this option, you should develop your ideas **in consultation with the course convener prior to week 7**. Ideas in other options could be used to support your application in this option.

3.4.8 Choosing the format

Picking the right format for your Professional Reflection is important to your success in this task. Think about what will deliver the most value to you as an individual.

Table 8: Pros and cons of Professional Reflection options

Option	Possible Pros	Possible Cons
Application Package	Help you get a job/scholarship	You do not want a job/scholarship
Professional Reflection	Help you take a helicopter view of the experience	You do not want to re-live the experience(!)

Option	Possible Pros	Possible Cons
Engineering Logbook	Allow you to track what you're doing during the project	Might realise that you're doing too much work in the team!
Continuing Professional Development	Allows you to build a network and prepare for EA membership	You will learn what you don't know, and want to bring that back into the project (more work!)
CPEng option	Do some serious future planning	It might be hard to imagine your path that far forward
Professional Accreditation option	Help you to complete your application	You need to have started building experience before the course

3.5 Marking criteria

Your work will be assessed against the following criteria:

- Professional approach and attitude [ad-hoc <-> conscientious]
- Evidence of learning [surface <-> deep]
- Maturity of reflection [not reflective <-> transformational]

For each of the criteria, the quality of the activity will be broadly evaluated against the levels in [Bloom's Taxonomy](#). A summary of this is provided below.

Evaluate & Create (Highest level)

Generate new ideas, defend opinions and decisions, justify a course of action by making judgements about information

- **Associated verbs:** Argue, Assemble, Assess, Compose, Construct, Create, Criticise, Debate, Defend, Decide, Design, Develop, Estimate, Evaluate, Formulate, Invent, Judge, Justify, Measure, Plan, Predict, Produce, Propose, Recommend, Test

Apply & Analyse

Examine and break information, explore relationship, use existing knowledge to solve new problem, apply knowledge in new situation

- **Associated verbs:** Analyse, Apply, Articulate, Calculate, Categorise, Change, Choose, Classify, Compare, Complete, Conclude, Contrast, Correlate, Deduce, Differentiate, Distinguish, Execute, Illustrate, Interpret, Investigate, Operate, Practice, Relate, Select, Separate, Show, Solve, Teach, Use

Understand & Remember (Lowest level)

Demonstrate an understanding of facts, explain ideas or concepts, recall facts, concepts or answers

- **Associated verbs:** Cite, Convert, Define, Demonstrate, Describe, Discuss, Explain, Extend, Find, Identify, Interpret, Label, List, Locate, Name, Outline, Paraphrase, Predict, Quote, Recall, Reproduce, Review, Summarise

3.5.1 Notes on reflective practice

This activity, regardless of the option you choose, will require some reflective practice. In this, you should aim to exhibit verbs at the higher end of Bloom's Taxonomy.

There are also some great resources for reflective writing available here:

- [Reflective Writing \(UNSW\)](#)
- [Reflective Writing \(Deakin\)](#)

3.6 Other comments

Submission is via a single PDF in Wattle. Referencing should be as appropriate for your format. As you are preparing your WPP, you should seek formative feedback as a formal agenda item from your tutor and project team.

3.6.1 Tips and suggestions

- If you are having trouble finding something relevant, it is wise career advice to think about the skills that you might need to get the job "two jobs from now", so that you can start to develop those skills with the next job.
- Keep a work diary - this will allow you to easily go back over your individual contribution.
- Attend useful Professional Development sessions that enhance your team's project, or even create opportunities for sharing your own skills.
- Be familiar with the professional/graduate job market and keep an eye out for applications you would like to actually go for.

4 Version Control

4.1 Authorship & Citation

This Course Guide and associated frameworks have been designed by Dr Chris Browne over many years of teaching, and ideas from this design have been published in multiple sources. Parts of this text originate from A/Prof Shayne Flint, from when this course was a part of TechLauncher. I acknowledge the hundreds of students, dozens of tutors and number of colleagues and clients who have provided input into the design as it is today. The design of the course today would not be possible without the critical collaborations with A/Prof Shayne Flint and Dr Lynette Johns-Boast, who pioneered authentic project-based learning in the Research School of Computer Science for over a decade, and Prof Richard Baker who showed me a better way to learn. - Chris Browne

As course convener Dr Catherine Galvin acknowledges the immense support from Dr. Chris Browne for his contribution to build up and set up a fantastic Capstone program and to train him to run the course in the right spirit and effective manner.

This acknowledgement cannot be removed from this guide without express permission from the Author. If you do like ideas here, please cite the source:

Browne, C., 2019, "Capstone Project Course Guide", ANU, accessed <>, <https://eng.anu.edu.au/courses/engn4221/students/ENGN4221_Assessment_Guide.pdf>

4.2 Document Information

Table 9: Document Information

This document	ENGN4221 Assessment Guide [Download as PDF]
Format	PDF preferred, also available as web page
Document type	Information and Procedures
Purpose	Overview of assessment processes for students undertaking ENGN4221 Systems Project
Semester	Semester 1, 2021
Audience	Current Students
Contact	catherine.galvin@anu.edu.au
Version	2021.S1 (See Change log)
Related Content	ENGN4221 Course Guide [Website] [Download as PDF]

4.3 Change log

2021.S1: 2021-02-16

- First commit for S2 2020

- updated dates