

# Unit Outline (Higher Education)

**Institute / School:** Institute of Innovation, Science & Sustainability

**Unit Title:** Advanced Engineering Project 1

**Unit ID:** ENGIN5002

**Credit Points:** 30.00

**Prerequisite(s):** (ENGIN3001 or ENGIN5001)

**Co-requisite(s):** Nil

**Exclusion(s):** (ENCOR7020)

**ASCED:** 039999

## Description of the Unit:

This course is intended to be taken in sequence with ENGIN5003 and will equip students with knowledge and skills to undertake an engineering research project. In the process, students will employ a combination of hands-on, analytical and computing skills relevant to their field of advanced study. Students will also critically review relevant literature and present findings in front of a peer based audience.

**Grade Scheme:** Graded (HD, D, C, P, MF, F, XF)

## Work Experience:

No work experience

**Placement Component:** No

**Supplementary Assessment:** No

Supplementary assessment is not available to students who gain a fail in this Unit.

## Course Level:

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## Learning Outcomes:

### Knowledge:

- K1.** Identify and select the appropriate approach to undertake an engineering research project at an advanced level.
- K2.** Apply critical and independent thinking to research design, investigation and experimentation.
- K3.** Identify and apply the ethics, norms and concepts that guide engineering (research) practice (including professionalism, innovation and adaptability).
- K4.** Recognise the importance of continuous professional development and awareness of the current engineering practice.

### Skills:

- S1.** Assess research literature to identify gaps in knowledge and to synthesize information and/or ideas at an advanced level.
- S2.** Demonstrate an ability to effectively manage time and research resources (independently and/or as a member of a team).
- S3.** Present and effectively communicate engineering research outcomes to others within the engineering profession and the wider community through written and verbal mediums.
- S4.** Elaborate on the limitations and uncertainties of research undertaken and formulate recommendations for future research.

### Application of knowledge and skills:

- A1.** Analyze and evaluate engineering research data at an advanced level (appropriate to the discipline or advanced field of research).
- A2.** Create a major piece of written work through the development of a thesis (commensurate with the discipline and field of research).

### Unit Content:

- Structuring and drafting of a research thesis.
- Producing a research paper out of the thesis work.

## FEDTASKS

Federation University Federation recognises that students require key transferable employability skills to prepare them for their future workplace and society. FEDTASKS (**T**ransferable **A**tttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are be embedded within curriculum, developed gradually towards successful measures and interlinked with cross-discipline and Co-operative Learning opportunities. *One or more FEDTASK, transferable Attributes, Skills or Knowledge must be evident in the specified learning outcomes and assessment for each FedUni Unit, and all must be directly assessed in each Course.*

FEDTASK attribute and descriptor	Development and acquisition of FEDTASKS in the Unit	
	Learning Outcomes (KSA)	Assessment task (AT#)

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 1 Interpersonal	Students at this level will demonstrate an advanced ability in a range of contexts to effectively communicate, interact and work with others both individually and in groups. Students will be required to display high level skills in-person and/or online in: • Using and demonstrating a high level of verbal and non-verbal communication • Demonstrating a mastery of listening for meaning and influencing via active listening • Demonstrating and showing empathy for others • High order skills in negotiating and conflict resolution skills\\ • Demonstrating mastery of working respectfully in cross-cultural and diverse teams.	Not applicable	Not applicable
FEDTASK 2 Leadership	Students at this level will demonstrate a mastery in professional skills and behaviours in leading others. • Creating and sustaining a collegial environment • Demonstrating a high level of self -awareness and the ability to self-reflect and justify decisions • Inspiring and initiating opportunities to lead others • Making informed professional decisions • Demonstrating initiative in new professional situations.	Not applicable	Not applicable
FEDTASK 3 Critical Thinking and Creativity	Students at this level will demonstrate high level skills in working in complexity and ambiguity using the imagination to create new ideas. Students will be required to display skills in: • Reflecting critically to generate and consider complex ideas and concepts at an abstract level • Analysing complex and abstract ideas, concepts and information • Communicate alternative perspectives to justify complex ideas • Demonstrate a mastery of challenging conventional thinking to clarify complex concepts • Forming creative solutions in problem solving to new situations for further learning.	Not applicable	Not applicable
FEDTASK 4 Digital Literacy	Students at this level will demonstrate the ability to work competently across a wide range of tools, platforms and applications to achieve a range of tasks. Students will be required to display skills in: • Mastering, exploring, evaluating, managing, curating, organising and sharing digital information professionally • Collating, managing complex data, accessing and using digital data securely • Receiving and responding professionally to messages in a range of professional digital media • Contributing competently and professionally to digital teams and working groups • Participating at a high level in digital learning opportunities.	Not applicable	Not applicable
FEDTASK 5 sustainable and Ethical Mindset	Students at this level will demonstrate a mastery of considering and assessing the consequences and impact of ideas and actions in enacting professional ethical and sustainable decisions. Students will be required to display skills in: • Demonstrate informed judgment making that considers the impact of devising complex solutions in ambiguous global economic environmental and societal contexts • Professionally committing to the promulgation of social responsibility • Demonstrate the ability to evaluate ethical, socially responsible and/or sustainable challenges and generating and articulating responses • Communicating lifelong, life-wide and life-deep learning to be open to the diverse professional others • Generating, leading and implementing required actions to foster sustainability in their professional and personal life	Not applicable	Not applicable

### Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-K3, S1-S3, A1	Presentation and reporting in the early weeks of the semester on the progress, which has been achieved thus far in the research project.	Progress report	5 - 10%
K1-K3, S1-S3, A1	Report on the continuous progress of research project	Continuous progress report and activity logs	10 - 20%
K1-K3, S1-S4, A1-A2	Demonstrable progress of a written dissertation or other modes of written work.	Final report	75 - 85%
K3, K4, S3	Completing 6-8 hours of equivalent professional development relevant to specialised fields of engineering in the form of participating in industry presentations, professional guest lectures, etc.	Participation in the required professional development hours	Hurdle

### Adopted Reference Style:

Other (IEEE-Refer to the library website for more information)

Refer to the [library website](#) for more information

Fed Cite - [referencing tool](#)