

Course Outline (Higher Education)

School:	School of Science, Engineering and Information Technology
Course Title:	RESEARCH AND QUANTITATIVE METHODS
Course ID:	ENGIN5001
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	ENGIN3001
ASCED:	030701

Description of the Course :

The course facilitates students to recognise knowledge gaps and identify research objectives, undertake effective literature reviews, determine appropriate methods and experimental design to collect, analyse and interpret information relevant to an area of engineering research. The course further develop students ability to critically and objectively reflect on knowledge and information of their own and others work.

Grade Scheme: Graded (HD, D, C, etc.)

Work Experience:

No work experience: Student is not undertaking work experience in industry.

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the course but gained a final mark of 45 per cent or above and submitted all major assessment tasks..

Program Level:

AQF Level of Program						
	5	6	7	8	9	10
Level						
Introductory						
Intermediate					✓	
Advanced						

Learning Outcomes:

On successful completion of the course the students are expected to be able to:

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Knowledge:

- K1.** Relate the process of analysis, identification and selection of appropriate methods and techniques to carry out a research project.
- K2.** Explain the importance of a good methodology to approach and undertake a complex engineering research project.
- K3.** Understand the importance of experimental design, including the accounting for uncertainty, when undertaking research.

Skills:

- S1.** Critically analyse information and data from a range of sources and at an advanced level.
- S2.** Demonstrate an ability to manage time, and potentially a complex set of resources, for the successful completion of an engineering project.
- S3.** Appropriately construct research questions suitable for the desired research outcomes.

Application of knowledge and skills:

- A1.** Critically and thoughtfully apply knowledge gained in a complex project environment.
- A2.** Development of research proposal.
- A3.** Apply developed oral and written communication skills in a complex project environment.

Course Content:

Topics may include:

- Research proposals: Research questions, aims, objectives, hypothesis.
- Information search: Process, sources, evaluation, references.
- Ethics: Informed consent, confidentiality, social and environmental factors.
- Quantitative data and qualitative data.
- Questionnaires, interviews, focus groups.
- Design of experiments.
- Statistical analysis of data.
- Critical analysis.

Graduate Attributes:

FedUni graduate attributes statement. To have graduates with knowledge, skills and competence that enable them to stand out as critical, creative and enquiring learners who are capable, flexible and work ready, and responsible, ethical and engaged citizens.

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Attribute	Brief Description	Focus
Knowledge, skills and competence	Engineering is a fast-changing technological area, which affects our every-day life. Students will demonstrate the development of the core knowledge, skills and competence needed to be a successful engineer.	High
Critical, creative and enquiring learners	Demonstration of the skills needed to be an independent, critical, and creative learner is an essential feature of engineering education. Within their studies, students will demonstrate an ability to be creative and critical.	High
Capable, flexible and work ready	To successfully complete the course, students will have to be able to acquire new knowledge and modify and harness existing methods for their technical needs. Students are expected to do so under minimum supervision with a high degree of autonomy. This will prepare them to practice the same level of autonomy in a workplace and show initiative-taking and self-reliance.	High
Responsible, ethical and engaged citizens	The course promotes ethical and professional conduct by adhering to best practice in acknowledging the sources of knowledge and data in their writing and presentations. Moreover, lab or industry-based effort will have to reflect a high level of professionalism and responsibility.	High

Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1 - K3, S1 - S3, A1 - A3	A research proposal report and / or presentation to justify the choice of the selected project through a detailed description of the work being proposed and an outline of the proposed research methodology to adopt.	Report and / or presentation	20% - 40%
K1 - K3, S1 - S3, A1 - A3	Undertake a literature review, develop a research methodology, and give a presentation and / or write a report examining a complex problem or concept in engineering.	Final project report and / or presentation	60% - 80%

Adopted Reference Style:

Other (IEEE)