

# Unit Outline (Higher Education)

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

**Unit Title:** Engineering Design 2

**Unit ID:** ENGRG1005

**Credit Points:** 15.00

**Prerequisite(s):** Nil

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

**Exclusion(s):** (ENGIN1004 and ENGIN3002)

**ASCED:** 039999

**Description of the Unit:**

The unit covers a basic process in engineering design, where students will be equipped with professional skills through steps-by-steps in solving real-world engineering problems. Students will gain an understanding in some fundamental principles in mathematics, physics and engineering sciences and competency in the technical tools and techniques required to successfully complete an engineering project. Moreover, by collaborating with other students in conducting, managing and delivering the engineering project, students will develop broad skill sets in communication, management, professional documentation and oral presentations which are strongly desired by industry.

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

**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 Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

**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"/>
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 type="checkbox"/>	<input type="checkbox"/>

### Learning Outcomes:

#### Knowledge:

- K1.** Identify design requirements given in engineering problems in order to propose appropriate solutions utilizing fundamental principles in mathematics, physics, and engineering sciences.
- K2.** Describe conceptual, physical and mathematical models of components, devices and systems for analysing, designing and solving engineering problems.
- K3.** Demonstrate a conceptual understanding of sustainable design and development in consideration of safety, health, societal, cultural, ethical and legal issues.

#### Skills:

- S1.** Select appropriate engineering approaches, tools and other resources to efficiently solve a complex engineering problem.
- S2.** Appraise current packages and tools, especially computerbased resources, for simulation, calculations, design, visualization, analysis and synthesis.
- S3.** Analyse dimensions and scope of an engineering project and then break down planning and management requirements to achieve an expected outcome.

#### Application of knowledge and skills:

- A1.** Apply established engineering methods and techniques to design, conduct and manage engineering projects.
- A2.** Develop hands-on skills by doing practical projects.
- A3.** Prepare a worldready engineer with professional documentation and communication skills through written reports and verbal presentations.

#### Unit Content:

Topics may include:

- Introduction to engineering design processes
- Basic electric circuits and applications
- Basic magnetic circuits and applications
- DC motors and generators
- Basic sensing/instrumentation and applications
- Thermofluids
- Computer based designing and drafting
- 3D printing
- System integration/fabrication
- Mini practical projects may include wind turbines, remote controlled forklift, solar water heater, mining machines (trucks), ....

#### Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K2	Numerical and conceptual tasks	Assignments/quizzes/reports	10% - 30%
S1-S3, A1-A3	Engineering design project	Reports/demonstrations/presentations	30% - 50%
K1-K3, S1-S2	Test of some or all of the unit materials	Test	20% - 40%

**Adopted Reference Style:**

IEEE

Refer to the [library website](#) for more informationFed Cite - [referencing tool](#)