



# Unit Outline (Higher Education)

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

**Unit Title:** Thermodynamics

**Unit ID:** ENGRG2304

**Credit Points:** 15.00

**Prerequisite(s):** (ENGRG1002 and ENGRG1004)

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

**Exclusion(s):** (ENGIN3304)

**ASCED:** 030701

**Description of the Unit:**

The unit will introduce students to the application of basic laws of thermodynamics to industrial processes and enhance the understanding of work, heat and entropy. The students will gain expertise to analyse a thermal process to evaluate energy transactions and the possibility of a thermal process to occur. The unit will also expose the students to real-life thermal applications found in industries and solve industrial problems.

**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"/>	<input type="checkbox"/>
Intermediate	<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 the basic laws of thermodynamics and their utility in thermal engineering
- K2.** Demonstrate the principles of engineering analysis as applicable to thermodynamics.
- K3.** Analyse thermodynamic problems relevant to industrial applications.

**Skills:**

- S1.** Apply the knowledge gained in a controlled laboratory environment.
- S2.** Apply existing and developing knowledge and experience.
- S3.** Develop and analyse thermodynamic methodologies.

**Application of knowledge and skills:**

- A1.** Apply knowledge gained in thermodynamics in controlled laboratory environment.
- A2.** Apply the developed thermodynamic knowledge to solve realistic problems.

**Unit Content:**

Topics may include:

- Thermodynamic cycles
- Entropy
- Reciprocating internal combustion engines
- Gas-turbine engines

**Learning Task and Assessment:**

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-K3, S2-S3, A2	Numerical problems to help students learn problem solving skills.	Numerical assignment	20-30%
S3, A1	Practical application of the basic thermodynamic principles in a laboratory setting.	Lab reports	20-30%
K1-K3, S1-S3, A2	Numerical problems and real engineering scenarios to assess student's understanding of application of the basic laws of thermodynamics	Quiz/Tests/Final Exam	30-50%

**Adopted Reference Style:**

IEEE

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

Fed Cite - [referencing tool](#)