



# Unit Outline (Higher Education)

<b>Institute / School:</b>	Institute of Innovation, Science & Sustainability
<b>Unit Title:</b>	Electrical and Electronic Drives and Actuators
<b>Unit ID:</b>	ENGIN2404
<b>Credit Points:</b>	15.00
<b>Prerequisite(s):</b>	(ENCOR1000 or ENCOR1021 or ENGIN1002)
<b>Co-requisite(s):</b>	Nil
<b>Exclusion(s):</b>	(ENMTX2040)
<b>ASCED:</b>	030101

## Description of the Unit:

This unit provides a broad overview of electrical and electronic drives and allows students to learn about machinery fundamentals and principles, transformers and AC / DC motors and generators. The unit also covers the fundamental concepts of power electronics and explains its application in motor control.

**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	■	■	■	■	■	■
Intermediate	■	■	✓	■	■	■

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Advanced	■	■	■	■	■	■

### Learning Outcomes:

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

#### Knowledge:

- K1.** Explain electric machinery principles in describing operations and characteristics of transformers, motors and generators.
- K2.** Describe power electronics application to electronic motor control.
- K3.** Explain operations and principles of single phase special purpose motors.
- K4.** Differentiate between different machinery and their applicability to execute a specific task

#### Skills:

- S1.** Calculate machine power and performance parameters.
- S2.** Draw circuit equivalence for relevant transformers, motors and generators.
- S3.** Design and select suitable power electronics control element for motor control.

#### Application of knowledge and skills:

- A1.** Determine a suitable machinery for a particular engineering system operating under certain conditions.
- A2.** Design and construct electronic motor controller.

#### Unit Content:

Topics may include:

- Introduction to machinery principles
- Transformers
- Introduction to power electronics
- AC and DC machinery fundamentals
- Synchronous motors and generators
- DC motors and generators
- Single phase and special purpose motors (e.g. stepper motors)

**Learning Task and Assessment:**

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
S1-S2, A1-A3	Experimental work and / or projects to verify students ability to apply knowledge and skills acquired in the unit	Reports, demonstrations	10 - 30%
K1-K4, S1-S2	Relevant tasks and problems to enforce understanding of the students and help in gradual development of knowledge and skills throughout the unit	Assignments, quizzes	10 - 30%
K1-K4	Questions and problems related to the unit contents	Mid and / or End of semester examination	40 - 60%

**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](#)