

School / Faculty: Faculty of Science and Technology

Course Title: ELECTRICAL AND ELECTRONIC DRIVES AND ACTUATORS

Course ID: ENGIN2404

Credit Points: 15.00

Prerequisite(s): (ENCOR1000 or ENCOR1021 or ENGIN1002)

Co-requisite(s): Nil

Exclusion(s): (ENMTX2040)

ASCED Code: 030101

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

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:

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.

Course Outline (Higher Education)

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A2. Design and construct electronic motor controller.

Course 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)

Values and Graduate Attributes:

Values:

- V1.** Appreciate the use and importance of electrical machinery in industrial process and daily life.
V2. Appreciate the use of power electronics in motor control applications.

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.

Attribute	Brief Description	Focus
Knowledge, skills and competence	Mechatronics is a fast-changing technological area which impacts on our every-day life. Students will develop an appreciation that learning is a life-long process.	High
Critical, creative and enquiring learners	Development of independent, critical and creative learners is an essential feature of engineering education. Assessments tasks are individualised, so students need to rely on their personal efforts to arrive at their conclusions.	High

Course Outline (Higher Education)

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Attribute	Brief Description	Focus
Capable, flexible and work ready	Mechatronics is an interdisciplinary engineering philosophy. It requires a team work approach to execute tasks to achieve common objectives. Training for engagements is built in to the Mechatronics program. A student will graduate with a new outlook as an engaging capable, flexible and work ready individual.	Low
Responsible, ethical and engaged citizens	Through the project-based learning of Mechatronics programme delivery, a student will value the engineering input for the advancement of humanity. Students are made aware that the engineer does not work or act in isolation, but is part of a wider community that includes many stakeholders, some of which may have no technical knowledge of what the engineer does. An awareness of community as a responsible, ethical and engaged citizen is important when finding a design solution.	Low

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Task	Assessment Type	Weighting
S1-S2, A1-A3	Experimental work and / or projects to verify students ability to apply knowledge and skills acquired in the course	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 course	Assignments, quizzes	10 - 30%
K1-K4	Questions and problems related to the course contents	Mid and / or End of semester examination	40 - 60%

Adopted Reference Style:

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