Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Unit Title:	ADVANCED MECHATRONIC SYSTEMS DESIGN
Unit ID:	ENGIN5401
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	030701

Description of the Unit:

This unit provides the technical background and practice of mechatronics including sensing, actuation and integration technologies for engineering environments. The unit provides a general understanding of automation technology in industry based applications and provides the skills in designing intelligent mechatronics systems incorporating artificial intelligence. Through this unit, students will appraise their understanding of the applications and importance of mechatronics system in engineering applications. Students will be able to interpret, analyse and exemplify different areas of mechatronics system design. Integrating this unit with the knowledge and understanding obtained in previous unitss, students will be able to contextualise, develop and analyse mechatonics systems for engineering processes.

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						
Advanced					✔	

Learning Outcomes:

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

Knowledge:

K1. Account for advanced understanding of the theory and applications of mecharonic systems.

K2. Explain principles for developing mechatronic systems and the failure criteria.

K3. Articulate comprehensive and authoritative understanding of different mechatronic system designs and criteria.

Skills:

S1. Reduce and interpret the behaviour of a complex mechatronic systems into appropriate sub-systems/elements.

S2. Evaluate performance of different mechatronic system designs.

S3. Design mechatronic systems with given specification.

Application of knowledge and skills:

A1. Interpret mathematical and theoretical knowledge to design and model effective mechatronic systems.

A2. Analyse suitable automatic control system in order to automate an engineering system.

A3. Apply computer simulation tools to model and examine mechatronic system designs.

Unit Content:

Topics may include:

Topics may include:

- Introduction to artificial intelligence technology in industry
- Understanding of the use of artificial intelligence in industrial automation
- Industrial sensing and actuation technologies
- Mechatronic system design
- Mechatronics in innovation

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1 - K3, S1 - S3, A1 - A2	Experimental work and / or projects to verify students ability to apply knowledge and skills acquired in the unit. Relevant tasks and problems to enforce understanding of the students and help in gradual development of knowledge and skills throughout the unit.	Reports / demonstrations / assignments / quizzes	30% - 50%

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1 - K3, S1 - S3, A1 - A3	Questions and problems related to the materials covered in the unit.	Mid and / or End of semester examination	50% - 70%

Adopted Reference Style:

Other (IEEE)

Refer to the library website for more information

Fed Cite - referencing tool