Unit Outline (Higher Education)

Institute / School: Institute of Innovation, Science & Sustainability

Unit Title: ROBOTICS

Unit ID: ENGIN3303

Credit Points: 15.00

Prerequisite(s): (ENGIN2303 and MATHS3001)

Co-requisite(s): Nil

Exclusion(s): Nil

ASCED: 030701

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. Describe and compare industrial robots and their classifications.
K2. Explain and analyse the mathematical models of industrial robots.
K3. Explain and demonstrate how an end-effector is positioned in space.
K4. Recognise and explain the accuracy of robot positioning

Skills:

S1. Demonstrate kinematic and dynamic analysis of robots.
S2. Demonstrate in depth the use of computer aided engineering for modelling and simulation of robots.
S3. Investigate and evaluate the accuracy of a robotic system with respect to industrial, national and international standards.
S4. Work independently and in teams to present your outcome clearly and professionally

Application of knowledge and skills:

A1. Program a robot to accurately achieve a desired task.
A2. Solve real engineering problems through symbolic, numeric and experimental dynamic analysis.

Unit Content:

Topics may include:

- Definitions and classifications
- Frame transformation and end-effector description
- Robot kinematics
- Accuracy and calibration of robot manipulators
- Differential Motion Analysis
- Robot programming and applications

Graduate Attributes

The Federation University Federation graduate attributes (GA) are entrenched in the Higher Education Graduate Attributes Policy (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni Courses. Graduate attribute attainment typically follows an incremental development process mapped through Course progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni Unit, and all attributes must be directly assessed in each Course**

Graduate attribute and descriptor		Development and acquisition of GAs in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	K1-K4, S3, A1, A2	AT1, AT2
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	K2, K3, S1-S3, A1, A2	AT2
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	S4	AT2
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	S2, S4. A1, A2	AT1, AT2
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	S2,S3, S4, A2, A2	AT2

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1- K4, S1 - S4, A1 - A2	An exercise that develops a conceptual idea and numerically analyses the validity of a range of scenarios	Team Report	40 - 60%
K1 - K4, S1 - S3, A1 - A2	Assessment of all or part of the unit by examination.	Examination / Test	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