



Course Outline (Higher Education)

School:	School of Engineering, Information Technology and Physical Sciences
Course Title:	ROBOTICS
Course 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)
Placement Component:	No
Supplementary Assessment:	Yes

Where supplementary assessment is available a student must have failed overall in the course but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

Program Level:

Level of course in Program	AQF Level of Program					
	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"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Learning Outcomes:

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

Knowledge:

- K1.** Describe industrial robots and their classifications.
- K2.** Explain the mathematical models of industrial robots.

- K3.** Explain how an end-effector is positioned in space.
K4. Describe the accuracy of robots and how to improve it.

Skills:

- S1.** Demonstrate the ability to carry out kinematic and dynamic analysis of robots.
S2. Demonstrate in depth the use of computer aided engineering for the modelling and simulation of robots.
S3. Evaluate the accuracy of a robotic system with respect to industrial, national and international standards.

Application of knowledge and skills:

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

Course 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

Values:

- V1.** Recognise that a robot represents a complex dynamic system.
V2. Recognise the need for robotics in industrial and non-industrial situations.
V3. Appreciate how important dynamic performance of a robot is for overall quality, efficiency, safety and reliability of industrial processes.
V4. Understand the needs for integrating dynamic aspects of a robot system analysis in machine systems design.

Graduate Attributes

The Federation University FedUni 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 programs. Graduate attribute attainment typically follows an incremental development process mapped through program progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni course, and all attributes must be directly assessed in each program**

Graduate attribute and descriptor		Development and acquisition of GAs in the course	
		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, AT3
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.	Not applicable	Not applicable
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, S3, A1, A2	AT1, AT2, AT3
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, A2, A2	AT2

Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1- K4, S1 - S3, A1 - A2	An exercise that develops a conceptual idea and numerically analyses the validity of a range of scenarios	Report	40 - 60%
K1 - K4, S1 - S3, A1 - A2	Assessment of all or part of the course by examination.	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](#)