



Course Outline (Higher Education)

School:	School of Engineering, Information Technology and Physical Sciences
Course Title:	INDUSTRIAL ROBOTIC SYSTEMS
Course ID:	ENGIN4401
Credit Points:	15.00
Prerequisite(s):	(ENGIN3406 or ENMTX4010)
Co-requisite(s):	Nil
Exclusion(s):	(ENMTX3070)
ASCED:	039999

Description of the Course:

This course introduces students to the industrial robotic systems with a focuses on designing and building robotic manufacturing cells, and explores the capabilities of current industrial equipment as well as the latest computer and software technologies. Further, attention is given to the input devices and systems that create efficient human-machine interfaces, and how they help non-technical personnel perform necessary programming, control, and supervision tasks. Selection of robot systems working envelopes, sensitivity, accuracy, etc. will be discussed.

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 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	■	■	■	■	■	■

Level of course in Program	AQF Level of Program					
	5	6	7	8	9	10
Intermediate	■	■	■	■	■	■
Advanced	■	■	■	✓	■	■

Learning Outcomes:

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

Knowledge:

- K1.** Explain common terminologies and conventions in industrial robotic systems.
- K2.** Explain the most important concepts in the selection of robotic systems.
- K3.** Understand the theories and mathematics underpinning the mobility of robot systems.

Skills:

- S1.** Design of industrial robotic systems.
- S2.** Mathematical modelling of industrial robotic systems.
- S3.** Use of mathematical tools for design and control of industrial robotic systems.

Application of knowledge and skills:

- A1.** Integrate knowledge for design and development of industrial robotic systems.
- A2.** Apply theories to analyse industrial robotic systems.
- A3.** Design industrial robotic systems for mechatronic applications such as manufacturing automation.

Course Content:

Topics may include:

- The current industrial robotic equipment including manipulators, control systems, and programming environments.
- Software interfaces that can be used to develop distributed industrial manufacturing cells and techniques which can be used to build interfaces between robots and computers.

Values:

- V1.** Appreciate the value of basic engineering theories for design and development of industrial robotic systems.
- V2.** Appreciate the importance of advance control of mechanisms for efficient operation of industrial robotic systems.

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-K3 S1-S3 A1-A3	1-3
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.	K1-K3 S1-S3 A1-A3	1-3
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.	A1-A3	1-3
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.	K1-K3 S1-S3 A1-A3	1-3
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.	A1-A3	1-3

Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
S1-S3, A1-A3	Understanding of principles and mathematics involved.	Laboratory and tutorials	10 - 30%
S1-S3, A1-A3	To verify the gradual understanding of concepts.	Assignments	20 - 40%
K1-K3, A1-A3	Questions and problems for the course content.	Exams / Tests	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](#)