



# Unit Outline (Higher Education)

**Institute / School:** Institute of Innovation, Science & Sustainability

**Unit Title:** Computer Aided Manufacturing

**Unit ID:** ENGRG9301

**Credit Points:** 15.00

**Prerequisite(s):** (ENGRG4201)

**Co-requisite(s):** Nil

**Exclusion(s):** Nil

**ASCED:** 030701

**Description of the Unit:**

This unit will cover the principles and applications of CAM in product and manufacturing design and is highly relevant to future trends in automation and manufacturing processes, focusing on PLC programming and industrial robotics. It aims to equip students with practical knowledge of widely used computer-aided manufacturing technologies. Additionally, the unit will address the automation of manufacturing processes and techniques for optimizing these 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            | ■                   | ■ | ■ | ■ | ■ | ■  |

| Level of Unit in Course | AQF Level of Course |   |   |   |   |    |
|-------------------------|---------------------|---|---|---|---|----|
|                         | 5                   | 6 | 7 | 8 | 9 | 10 |
| Advanced                | ■                   | ■ | ■ | ■ | ✓ | ■  |

### Learning Outcomes:

#### Knowledge:

- K1.** Explain PLC and Robotic programming language
- K2.** Explain AD/DA signal conversion and conversion precision
- K3.** Explain industrial robotics in manufacturing

#### Skills:

- S1.** Use PLC and Robotic programming for manufacturing process automation
- S2.** Handle industrial data and programming applications for industrial process control
- S3.** Design and selection of industrial control systems for manufacturing

#### Application of knowledge and skills:

- A1.** Apply advanced engineering techniques to control manufacturing systems and processes
- A2.** Design engineering systems for manufacturing and/or processes.

#### Unit Content:

- Role of computer modeling in modern design and manufacturing
- Introduction to 3D Modelling and integrated CAM/CAE systems
- PLC for manufacturing
- Industrial robots for manufacturing
- Advance technologies for manufacturing

### Learning Task and Assessment:

| Learning Outcomes Assessed | Assessment Tasks  | Assessment Type             | Weighting |
|----------------------------|---|-----------------------------|-----------|
| S1,S2,S3,A1,A2             | Experimental work and / or projects to verify students ability to apply knowledge and skills acquired in the unit.                                | Reports, demonstrations     | 20-40%    |
| K1,K2,K3, S1, S2           | Relevant tasks and problems to enforce understanding of the students and help in gradual development of knowledge and skills throughout the unit. | Assignments, quizzes.       | 20-40%    |
| K1, K1,K3                  | Questions and problems related to the unit contents.  | End of semester examination | 30-50%    |

### Adopted Reference Style:

IEEE

Refer to the [library website](#) for more information

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