Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Unit Title:	Smart Engineering Technologies
Unit ID:	ENGRG9401
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	(ENGIN5508)
ASCED:	030303

Description of the Unit:

ENGIN5508 SMART ENGINEERING TECHNOLOGIES introduces some technologies demanded in modern engineering practices, including, but not limited to, modern tunnelling technologies, sensor technologies, industrial robots, data analytics and artificial intelligence. It aims to enable the students ready for tomorrow`s professionals in engineering and applied science.

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:

This unit qualifies students to apply smart or emerging technologies for engineering applications. Students enrolled in this unit will be exposed to a range of technologies, including, but not limited to, modern tunnelling technologies, sensor technologies, industrial robots, data analytics and artificial intelligence, empowering students to undertake engineering professional practices using smart technologies in the digital era.

Knowledge:

K1. Explain shaft sinking and tunnelling by drilling and blasting method.

K2. Describe mechanised tunnelling method.

K3. Identify sensoring technologies for engineering application.

K4. Observe engineering applications of robots.

K5. Recognise engineering applications of data analytics.

K6. Review engineering applications of artificial intelligence.

Skills:

S1. Select appropriate tunnelling method for applications in mining and civil engineering.

S2. Analyse tunnelling projects and provide solutions to complex underground tunnelling problems.

S3. Investigate emerging technologies for engineering applications to improve performance, including, but not limited to, new tunnelling technologies, sensor technologies, industrial robots, data analytics and artificial intelligence.

Application of knowledge and skills:

A1. Evaluate, plan, and implement a tunnelling system for a project.

A2. Apply emerging technologies for engineering applications to improve performance, including, but not limited to, new tunnelling technologies, sensor technologies, industrial robots, data analytics and artificial intelligence.

Unit Content:

Topics may include:

- Tunnelling by drilling and blasting.
- Mechanised tunnelling.
- Sensor technologies.
- Industrial robots.
- Data analytics.
- Artificial intelligence.

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-2, S1-2, A1	Numerical and conceptual tasks	assignments	15-30%
K3-6, S3, A2	Up to three projects covering tunnelling technologies, sensor technologies, industrial robots, data analytics or artificial intelligence, or other emerging technologies specified by the unit coordinator.	reports	70-85%

Adopted Reference Style:

Other (IEEE)

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

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