Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science, and Sustainability
Unit Title:	Digital Communication Principles
Unit ID:	ENGIN3104
Credit Points:	15.00
Prerequisite(s):	(ENGIN2102)
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	031301

Description of the Unit:

This unit facilitates learning and understanding of the fundamental signal processing and modulation concepts and methods that underpin wired and wireless digital communications systems. The unit illustrates basic building blocks of a digital communication system (channel encoder / decoder, digital modulator / demodulator and channel characteristics). The focus is on mathematical underpinnings of communications theory along with links to real life industry applications.

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. Recognise common signal processing concepts and methods applicable to digital communication systems.

K2. Explain working principles and building blocks of digital communication systems.

K3. Demonstrate knowledge and understanding of different characterisation of digital communication signals and systems.

Skills:

S1. Design and synthesise signal processing modules to implement digital communication systems.

S2. Assess the effect of signal noise in digital communication systems.

S3. Evaluate the performance of digital communication systems under different environments.

Application of knowledge and skills:

A1. Interpret performance of various modulation and signal processing techniques for digital communication.

A2. Apply software tools to simulate and study characteristics and behaviour of digital communication systems.

A3. Analyse fundamental limits and different challenges associated with digital communication systems.

Unit Content:

Topics may include:

- Introduction to digital communication
- Coding for discrete sources
- Quantization
- Source and channel waveforms
- Vector spaces and signal space
- Channels, modulation, and demodulation
- Random processes and noise
- Detection, coding, and decoding
- Wireless digital communication

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1 - K3, S1, A3	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% - 30%
K3, S2, S3, A1-A3	Experimental/simulation work to verify students' ability to apply knowledge and skills acquired in the unit.	Report	20% - 30%

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-K3, S1-S3, A1, A3	The examination tests analytical and critical thinking and a general understanding of the unit materials.	Test or exam	40% - 60%

Adopted Reference Style:

Other (IEEE)

Refer to the library website for more information

Fed Cite - referencing tool