Module code	TF-3304		
Module Title	Digital Signal Processing		
Degree/Diploma	Bachelor of Engineering (Information Communication Systems)		
Type of Module	Major Option		
Modular Credits	2	**Total student workload**	4 hours/week
		Contact hours	2 hours/week
Prerequisite	None		
Anti-requisite	None		

Aims

The module exposes students to topics of Digital Signal Processing and their applications to engineering problems. In particular, students will learn time-domain characterisations, transform-domain characterisations, transform-domain analysis of Linear Time Invariant (LTI) systems and digital processing of continuous-time signals.

Learning Outcomes:

On successful completion of this module, a student will be expected to be able to:

Lower order :	30%	- read and recall types of digital signal processing systems
Middle order :	40%	- describe problems related to digital signal processing systems - analyse data related to noise in digital signal processing systems
Higher order:	30%	- compute the discrete time Fourier transform of signals - appraise the different types of digital filters - present the information with proper descriptions justifying their applicability in different digital signal processing system scenarios

Module Contents

- Basic operations and classifications of discrete-time (DT) signals
- DT systems properties, impulse response and linear convolution
- DTFT, DFT, Z-transform and properties; circular convolution; and linear convolution by DFT/FFT
- Polezero locations versus causality and stability; and partial-fraction expansion
- Frequency response, magnitude, phase and group delays; and transfer functions
- Ideal filters; linear-phase FIR filters; simple standard FIR and IIR filters; comb filters; all-pass filters; minimum-phase and maximum phase; and inverse systems
- Sampling theorem, reconstruction, and analog filters
- Digital filter design

Assessment	Formative assessment	Monthly online quizzes will be used to test and to give feedback for their learning
	Summative assessment	Examination: 50%
		Coursework: 50% - 1 class test (10%) - 2 individual assignments (10% each) - 2 individual laboratory reports (10% each)