Module Code	ET 3142	**Module Title**	**Digital Signal Processing**			
Credits	2	**Hours/ Semester**	**Lectures**	24	**Prerequisites**	ET2103
GPA/ NGPA	GPA		**Continuous Assessments/ Tutorials**	12		
Module Objectives		To provide the students with the knowledge of Digital Signal processing				
Learning Outcomes		After the completion of this module, the learner will be able to, LO1: **Discuss** the fourier transform in discrete time and discrete frequency domain LO2: **Design**digital FIR filters for given specifications LO3: **Design** digital IIR filters for given specifications LO4: **Analyze** a given filter for performance and stability				
Contents		**Fourier transforms, sampling** A/D conversion and quantization, D/A conversion, Polyphase decomposition, Polyphase DFT filterbanks, Bandpass sampling				LO1
		The Discrete Fourier Transform Definition of DFT and relation to Z-transform, Properties of the DFT, Linear and periodic convolution using the DFT, Zero padding, spectral leakage, resolution and windowing in the DFT				LO1
		Filters Averaging filter, Recursive smoother, First-order notch filter, Second-order unity gain resonator, All-pass filters, Comb filters, Equalization filters, Group delay, linear phase, all-pass, minimum phase, Stability and stability verification methods.				LO4
		Digital filter design Finite impulse response (FIR): Window design techniques, Kaiser window design technique, Equiripple approximations				LO2
		Infinite impulse response (IIR): Bilinear transform method, Examples of bilinear transform method, Structures and properties of FIR and IIR filters and review: IIR - Direct, parallel and cascaded realization, FIR – Direct and cascaded realizations, Coefficient quantization effects in digital filters				LO3
Laboratory/ Practical Sessions		• Filter design using IIR, FIR • Signal Procesing Using FFT • Testing filter stability in MatLab				LO1-4
Method of Assessment		Continuous assessments : 30% End semester examination : 70%				
References		1. Discrete-Time Signal Processing (3rd Edition),Alan V. Oppenheim, ISBN-13:978-0131988422 2. Schaums Outline of Digital Signal Processing, 2nd Edition,son Hayes, ISBN-13: 978-0071635097				