

Annexure 1

Detailed Syllabus of Course

S. No	Module Title	Topics	Duration (Hours)		Learning Outcome
			Theory	Lab	
1.	Introduction to MATLAB	<ul style="list-style-type: none">• Digital signal processing(DSP)• Why Signal processing needed?• How Signal Are Processed?• History of MATLAB• MATLAB Version.• Advantages of MATLAB• Command window, workspace and Toolbars	3	2	<ul style="list-style-type: none">• Understand Familiarization with MATLAB Environment and the advantages and disadvantages of MATLAB• Understand signal Processing need and the uses of MATLAB.

2	MATLAB Basics	<ul style="list-style-type: none"> • MATLAB Basics • Variables • Vectors in MATLAB • Array and Matrices • Array and Matrices Creation • Simple algebraic operations (like addition, subtraction, multiplication and division) on Array and Matrices. • Matrix operations • Operators • Operators used in MATLAB (Logical Operator and Relational Operators) • Operators Precedence in MATLAB • Displaying and plotting of Output • Displaying of Output Data • Introduction to plotting ,types of plot and command used for plotting, 	5	10	<ul style="list-style-type: none"> • Understand the Implementations of Array and matrix and their operations • Understand to plot various mathematical function
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3	Boolean Algebra, Conditional Statements, Loops	<ul style="list-style-type: none"> • Boolean algebra • MATLAB Boolean logic with examples, use of comparison operators and comparison with vectors. • Conditional Statements • If-else-end statement, Nested if –end statement • Special commands “break” and “continue” • For loop and while loop • Nested Loop 	3	7	<ul style="list-style-type: none"> • Use for loop, while loop and nested loop in MATLAB programming. • Solve various mathematical and logical problems
4	MATLAB Function	<ul style="list-style-type: none"> • Scripts • Introduction to MATLAB Function • Basic Pre-Defined Function • Basic mathematical problem using Function in MATLAB 	3	5	<ul style="list-style-type: none"> • Understand difference between Script file and Function file. • Understand the uses of Function in MATLAB and their advantages.

5	Discrete time sequence	<ul style="list-style-type: none"> • Discrete time sequence • Unit impulse sequence • Implementation of sequence and their plot using different MATLAB code • Unit Step Sequence • Implementation of sequence and their plot using different MATLAB code • Ramp sequence • Implementation of sequence and their plot using different MATLAB code • Exponential sequence • Implementation of sequence and their plot using different MATLAB code • Sinusoidal and cosine sequence • Implementation of sequence and their plot using different MATLAB code 	2	3	<ul style="list-style-type: none"> • Understand implement and plot various type of Discrete time sequence
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6	Sampling and Convolution	<ul style="list-style-type: none"> • Sampling and Convolution • Sampling using MATLAB • Linear convolution • Circular Convolution 	2	5	<ul style="list-style-type: none"> • Understand Sampling and Convolution and its implementation in MATLAB
7	Transformation of signal	<ul style="list-style-type: none"> • Discrete-time Fourier Transform • Discrete-time Fourier Transform using MATLAB code • The properties of Discrete-time Fourier Transform • Z-Transform • Z-transform using MATLAB code • Properties of Z-transform 	5	10	Implementation of Various Transform and its properties using MATLAB

		<ul style="list-style-type: none"> • Discrete Fourier Transform • Discrete Fourier Transform using MATLAB Code • Fast Fourier Transform using MATLAB code 			
8	Implementation of Discrete Time Filter	<ul style="list-style-type: none"> • Implementation of Discrete Time Filter • Basics Elements in Filter Design • IIR Filter Structures • FIR Filter Structures • IIR Filter Design • FIR Filter Design 	5	10	•Implement and Design Filters u

9	MATLAB for Embedded DSP	<ul style="list-style-type: none"> •Programming of DSP board through MATLAB, •Real Time Signal Processing, MATLAB Toolbox for Data Acquisition • Applying Signal Processing Algorithm •Embedded implementation 	2	8	<ul style="list-style-type: none"> • Implementation of signal processing algorithm on a DSP development board through MATLAB
Total			90 Hours(Theory-30, Lab-60)		