III B.Tech – II Semester (20EC6112) DIGITAL SIGNAL PROCESSING LAB

Int. Marks	Ext. Marks	Total Marks	L	Т	Р	С
15	35	50	-	-	3	1.5

Pre-Requisites: Signals & Systems

Course Objectives:

- To perform basic signal processing operations such as Linear Convolution, Circular Convolution, Auto Correlation, Cross Correlation and Frequency analysis in MATLAB
- To implement DIT and DIF radix-2 FFT algorithms
- To implement FIR and IIR filters in MATLAB
- To demonstrate the Multi-rate signal processing concepts using DSP Processor

List of Experiments:

- 1. To find Linear and Circular convolution for the given two sequences
- 2. To find Auto correlation and Cross Correlation for the given two sequences
- 3. Implementation of Linear convolution using DFT (Overlap-add and Overlap-Save methods)
- 4. Computation of N point DFT of a given sequence and to plot magnitude and phase spectrum
- 5. Implementation of Decimation-in-time radix-2 FFT algorithm
- 6. Implementation of Decimation-in-frequency radix-2 FFT algorithm
- 7. Design of IIR filters (LPF/HPF) and demonstrates the filtering operation
- 8. Design of FIR filters (LPF/HPF) and demonstrates the filtering operation
- 9. Implementation of Decimation and Interpolation Process
- 10. Implementation of I/D sampling rate converters
- 11. To Perform MAC operation using various addressing modes in DSP Processor
- 12. Implementation of Up-sampling and Down-sampling operations in DSP Processor

Equipment required:

- 1. MATLAB / SCI Lab / Equivalent Industrial Standard Licensed simulation software tool.
- 2. Computer Systems with required specifications
- 3. DSP Processor.

Course Outcomes:

After successful completion of the course, the students can be able to:

S. No	Course Outcome					
1.	Compute Convolution and correlation of given sequences					
2.	Understand and Analyze DFT and FFT algorithms					
3.	Design IIR and FIR filters for the given specifications	L5				
4.	Implement Decimation, Interpolation and Sampling rate converters	L3				
5.	Implement up sampling down sampling using DSP processors	L3				

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CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	2	-	-	-	2	-	-	-	3	-	-	-	2	2
CO 2	2	-	-	-	2	-	-	-	3	-	-	-	2	2
CO 3	2	2	-	-	2	-	-	-	3	-	-	-	2	2
CO 4	2	2	-	-	2	-	-	-	3	-	-	-	2	2
CO 5	2	2	-	-	2	-	-	-	3	-	-	-	2	2

Correlation of COs with POs & PSOs: