Year & Semester : III-II

Lab In charge

Mr. S. Munawwar, M. Tech
Assistant Professor,
E.C.E Department.

Ms. Lakshmi Punitha
Lab Technician
E.C.E Department.

Digital Signal Processing Laboratory

Course Objectives:

1. To make students skilled in design real time DSP systems and real world applications.
2. To implement DSP algorithms using both fixed and floating point processors.
3. To make the students in creation of the basis function for different transforms.

Course Outcomes:

1. The students are expected to design real time DSP systems and real world applications.
2. The students are able to implement DSP algorithms using both fixed and floating point processors.

List of Experiments: Part -A Software Experiments (MATLAB V7.1)

1. Generation of random signal and plot the same as a waveform showing all the specifications.
2. Finding Power and (or) Energy of a given signal.
3. Convolution and Correlation (auto and cross correlation) of discrete sequences without using built in functions for convolution and correlation operations.
4. DTFT of a given signal.
5. N – point FFT algorithm.
6. Design of FIR filter using windowing technique and verify the frequency response of the filter.
7. Design of IIR filter using any of the available methods and verify the frequency response of the filter.
8. Design of analog filters.

Part -B Software Experiments (Code Composer Studio V3.3)

1. Generation of random signal and plot the same as a waveform showing all the specifications.
2. Finding Power and (or) Energy of a given signal.
3. Convolution and Correlation (auto and cross correlation) of discrete sequences without using built in functions for convolution and correlation operations.
4. DTFT of a given signal.
5. N – point FFT algorithm.
6. Design of FIR filter using windowing technique and verify the frequency response of the filter.
7. Design of IIR filter using any of the available methods and verify the frequency response of the filter.
8. Design of analog filters.

Note: -Five experiments must be conducted in above each part.

Equipment required for the Laboratory:

Soft wares:

1. MATLAB 7.10 Software Tool
2. Code Composer Studio V3.3 Software Tool

Hardware:

1.Code Composer Studio Kit
2.Computers (Windows XP)
3.Analog/Digital Storage Oscilloscopes.
4.Function Generators.
4.Digital Multi-meters.

Year & Semester : IV-I

Lab In charge

Mr. V. Nagamani, M. Tech
Assistant Professor,
E.C.E Department.
Ms. Lakshmi Punitha
Lab Technician
E.C.E Department.

VLSI & ES Laboratory

Course Objectives:

1. To familiarize the student to design and draw the internal structure of the various digital integrated circuits.
2. To make the students develop VHDL/Verilog HDL source code, perform simulation using relevant simulator and analyze the obtained simulation results using necessary synthesizer.
3. To make the students to verify the logical operations of the digital ICs (Hardware) in the laboratory.

Course Outcomes:

1. The students will be able to design and draw the internal structure of the various digital integrated circuits
2. The students will be able to develop VHDL / Verilog HDL source code, perform simulation using relevant simulator and analyze the obtained simulation results using necessary synthesizer.
3. The students are expertise Verify the logical operations of the digital IC's (Hardware) in the laboratory.

List of Experiments:

Part-A VLSI

1. Realization of Logic Gates.
2. 13- to - 8Decoder- 74138.
3. 8 x 1 Multiplexer-74151 and 2 x 4 De-multiplexer-74155.
4. 4-Bit Comparator-7485.
5. D Flip-Flop-7474.
6. Decade counter-7490.
7. Shift registers-7495. 8. ALU Design.

Part-B Embedded C

1. Learn and understand how to configure EK-TM4C123GXL Launch pad digital I/O pins. Write a C program for configuration of GPIO ports for Input and output operation (blinking LEDs, push buttons interface).
2. Learn and understand Timer based interrupt programming. Write a C program for EK-TM4C123GXL Launch pad and associated Timer ISR to toggle onboard LED using interrupt programming technique.
3. Configure hibernation module of the TM4C123GH6PM microcontroller to place the device in low power state and then to wake up the device on RTC (Real- Time Clock) interrupt
4. Configure in-build ADC of TM4C123GH6PM microcontroller and interface potentiometer with EK-TM4C123GXL Launch pad to observe corresponding 12- bit digital value
5. Learn and understand the generation of Pulse Width Module (PWM) signal by configuring and programming the in-build PWM module of TM4C123GH6PM microcontroller.
6. Configure the PWM and ADC modules of TM4C123GH6PM microcontroller to control the speed of a DC motor with a PWM signal based on the potentiometer output.
7. Learn and understand to connect EK-TM4C123GXL Launch pad to PC terminal and send an echo of the data input back to the PC using UART.
8. Learn and understand interfacing of accelerometer in Sensor Hub Booster pack with EK-TM4C123GXL Launch pad using I2C.
9. USB bulk transfer mode: Learn and understand to transfer data using bulk transfer mode with the USB2.0 peripheral of the TM4C123GH6PM device.
10. Learn and understand to find the angle and hypotenuse of a right angle triangle using IQmath library of TivaWare.
11. Learn and understand interfacing of CC3100 WiFi module with EKTM4C123GXL Launch pad and configuration of static IP address for CC3100 booster pack.
12. Configure CC3100 Booster Pack connected to EK-TM4C123GXL Launch pad as a Wireless Local Area Network (WLAN) Station to send Email over SMTP.
13. Configure CC3100 Booster Pack connected to EK-TM4C123GXL Launch pad as a HTTP server.

Note: -Five experiments must be conducted in above each parts.

Equipment required for the Laboratory:

Software:
1. XILINX v9.1i software tool
2. Code Composer Studio V6.1.2 Software Tool

Hardware:
1.FPGA Kits (Sparton 3)
2.Embedded System Kits
3..Computers (Windows XP & Windows 7)
4.Analog/Digital Storage Oscilloscopes.
5.Potential Meters
6.Multimeters
7.Connecting Wires.
8.CRO Probes etc..