DEPARTMENT OF COMPUTER SYSTEM ENGINEERING

UNIVERSITY OF ENGINEERING & TECHNOLOGY PESHAWAR

Fall 2022

CSE 402L: DIGITAL SIGNALS PROCESSING LAB

Course Learning Objectives

Credit Hours: 1
Contact Hours: 3

Grading:
- Final Term
- Mid Term
- Lab Performance
- Project
- Viva

1. COURSE OUTLINE:

DSP is a field that involves the analysis, processing, and synthesis of digital signals. It has a wide range of applications and is used in various fields such as telecommunications, audio and video processing, medical imaging, and more.

In this Lab, students are introduced to the fundamentals of discrete-time signals and systems like Modulators, Demodulators, Multiplexers and Demultiplexers. They learn about techniques for signal analysis and processing using Modern Tools like Matlab and Simulink. This Lab uses https://www.mathworks.com/support/learn-with-matlab-tutorials.html where state of the art knowledge and Skills are available.

2. Weekly Course Outline:

Weeks	Lab No	Experiments
Week 1	Lab 1	Matlab Training by MathWork (Matlab Academy)
Week 2	Lab 1	Matlab Training by MathWork (Matlab Academy)
Week 3	Lab 2	Signal Analysis in both time and frequency domain using Matlab
Week 4	Lab 3	Spectral Analysis of a random Signal using Matlab
Week 5	Lab 4	Analysis of Amplitude Modulated Signal using Matlab
Week 6	Lab 5	Analysis of Amplitude Demodulated Signal using Matlab
Week 7	Lab 6	Compare Double-Sideband and Single-Sideband Amplitude Modulated Signal using Matlab
Week 8		**MIDTERM EXAM**
Week 9	Lab 7	Simulink Training to demonstrate the use of Simulink products using MathWork (Matlab Academy)
Week 10	Lab 8	Modeling Frequency Division Multiplexing using Matlab
Week 11	Lab 9	Modeling Frequency Division De- Multiplexing using Matlab
Week 12	Lab 10	Signal Processing Training from MathWork (Matlab Academy)
Week 13		**Open Ended Lab (project)**
Week 14		**Open Ended Lab (project)**
Week 15		**Presentation**
Week 16		**Final Lab Exam**

3. CLASS LEARNING OUTCOMES:

At the end of the course, the students will be able to:

CLO #	CLO	Cognitive Domain	
CLO-1	Have a thorough understanding of working of the modern signal processing tools i.e. MATLAB and Simulink.	C2	
CLO-2	Implement DSP algorithms in MATLAB.	C5	
CLO-3	Analyze signals and systems using simulations and graphical tools.	C4	

4. RESOURCES:

- ○ https://www.mathworks.com/support/learn-with-matlab-tutorials.html
- ○ Digital Signal Processing: A Practical Approach by Emanual C.Ifeachor 2nd edition. Prentice Hall.
- ○ DSP Lab Manual

5. MAPPING OF CLOs WITH COURSE ASSESSMENT TOOLS:

Assessment Tools	CLOs		
	CLO 1	CLO 2	CLO 3
Lab Reports			
Lab Performance	✓	✓	✓
Midterm Exam	✓	✓	✓
Final Exam			✓
DSP Project			
Viva	✓		