**University of Management and Technology**

**Course Outline**

Course code EL415 Course title: Digital Signal Processing Lab

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| Program | BSEE |
| Credit Hours | 1 |
| Duration | One Semester |
| Prerequisites | Signals and Systems |
| Resource Persons | Khalid Ijaz |
| Counseling Timing | See Office doors. |
| Contact | [Khalid.ijaz@umt.edu.pk](mailto:Khalid.ijaz@umt.edu.pk) |

**Chairman/Director signature………………………………….**

**Dean’s signature…………………………… Date………………………………………….**

**Learning Objective:**

**The objectives of this course are:**

This course aims to develop mathematical and analytical skills necessary to analyze digital signals both in time and frequency domains. From the system’s perspective, the objective is to incorporate extensive design skills in the students enabling them to develop relevant prototypes with the desired level of accuracy.

**Learning Methodology:**

Lecture, interactive, participative, active learning.

**Grade Evaluation Criteria**

Following is the criteria for the distribution of marks to evaluate final grade in a semester.

**Marks Evaluation Marks in percentage**

Lab Performance + Project 40%

Final Viva 60%

Total 100%

**Recommended Text Books:**

1. Digital Signal Processing Principles, Algorithms, and Applications (Fourth edition) by John G. Proakis and Dimitris G. Manolakis

**Reference Books:**

1. R. J. Schilling and S. L. Harris, "Fundamentals of Digital Signal Processing Using MATLAB", Thomson.

**Calendar of Course contents to be covered during semester**

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| **Week** | **Course Contents** | **Reference to text book chapter(s)** |
| 1 | Getting Started with MATLAB for Digital Signal Processing | TB: Chapter 1 |
| 2 | Discrete Time Signals and Systems | TB: Chapter 2 |
| 3 | Analyze Discrete Time systems in MATLAB | TB: Chapter 2 |
| 4 | Z-transform | TB: Chapter 3 |
| 5 | Discrete Time Fourier Transform (DTFT) in MATLAB | TB: Chapter 4 |
| 6 | Frequency Analysis of Signals and Systems | TB: Chapter 4 |
| 7 | Discrete Fourier Transform (DFT) using an Audio Example and Power spectrum of an Audio Signal | TB: Chapter 4 |
| 8 | Introduction to DSP Starter Kit (DSK) TMS320C6713 DSP Kit and Code Composer Studio | TB: Chapter 4 |
| 9 | Simple Audio Loop back on TMS320C6713 by programming Audio Codec AIC23 | TB: Chapter 4 |
| 10 | Effects of Sampling, Aliasing and Quantization. | TB: Chapter 6 |
| 11 | Signal Reconstruction using Analog Low Pass Filter | TB: Chapter 6 |

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| 12 | Design of FIR Filter using FDATool and FVTool, | TB: Chapter 10 |
| 13 | Design of IIR Filter in MATLAB | TB: Chapter 10 |
| 14 | Project | TB: Chapter 1 to Chapter 10 |