**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 Sessional Evaluation 40%

Final Viva Voce 60%

Total 100%

**Recommended Text Books:**

Lab Manual.

**Reference Books:**

1. John G. Proakis and Dimitris K. Manolakis, “Digital Signal Processing – Principles, Algorithms and Applications,” 4th Edition, Prentice Hall.
2. R. J. Schilling and S. L. Harris, "Fundamentals of Digital Signal Processing Using MATLAB", Thomson.

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

**Course code……EL 415……………… Course title……Digital Signal Processing Lab**

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

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| 10 | Signal Reconstruction using analog Low Pass filters | Lab 10 |
| 11 | Design of FIR Filter using FDATool and FVTool | Lab 11 |
| 12 | Design of FIR Filter using Windowing and Frequency sampling | Lab 12 |
| 13 | Design of IIR Filter in MATLAB | Lab 13 |
| 14 | IIR and FIR Filter Design using DSK 6713 | Lab 14 |