# Department of Robotics and Mechatronics Engineering
# University of Dhaka
## Course Outline

**Session:**
**Course: RME 4103: Digital Signal Processing**
**Total Credit – 3**

### Course Outline

| Sl | Course Content | No. of Lecture |
|---|---|---|
| 1 | Signal, System and Processing, Advantages and Limitations of DSP, Components of DSP, Classification of Signals, Discrete-time Signals and Systems | 3 |
| 2 | Discrete-Time Signals, Discrete-Time Systems, Analysis of Discrete-Time Linear Tim e Invariant Systems, Implementation of Discrete-Time Systems. | 3 |
| 3 | Correlation of Discrete-Time Signals | 3 |
| 4 | Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) of Discrete-time Systems, Structures for IIR Systems, Difference Equation, Convolution. | 3 |
| 5 | Transient and Steady State Response Discrete Transformations: Discrete Fourier Series, Discrete-time Fourier series, Discrete Fourier Transform (DFT), Properties of the DFT, Fast Fourier transform (FFT),Inverse Fast Fourier Transform. | 4 |
| 6 | Incourse – 1 | 1 |
| 7 | Z-Transformation - Properties, Transfer Function, Poles and Zeros and Inverse Z Transform | 2 |
| 8 | Correlation: Circular Convolution, Autocorrelation and Cross-correlation. | 2 |
| 9 | Digital Filters: FIR Filters - Linear Phase Filters, Design of FIR Filters, Specifications, Round -Off Effects in Digital Filter, Filters Design using Window. | 3 |
| 10 | Optimal and Frequency Sampling Methods. | 3 |
| 11 | Incourse – 2 | 1 |
| 13 | Revision Class | 2 |
| **Total Number of lectures** | | **30** |

### Text Book

| Name of the Book | Author's Name |
|---|---|
| Digital Signal Processing, Fourth Edition, Prentice Hall | John G. Proakis Dimitris K. Manolakis Fourth Edition |

### Reference Book

| Name of the Book | Author's Name |
|---|---|
| Digital Signal Processing , 3rd Edition– Pearson. | Alan V. Oppenheim and Ronald W. Schafer |

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