



**E2MATRIX**

**Training and Research Institute**

[www.e2matrix.com](http://www.e2matrix.com)

## **COMMUNICATION SYSTEM Course Structure**

In telecommunication, a communications system is a collection of individual communications networks, transmission systems, relay stations, tributary stations, and data terminal equipment (DTE) usually capable of interconnection and interoperation to form an integrated whole. The components of a communications system serve a common purpose, are technically compatible, use common procedures, respond to controls, and operate in union. Telecommunications is a method of communication (e.g., for sports broadcasting, mass media, journalism, etc.). A communications subsystem is a functional unit or operational assembly that is smaller than the larger assembly under consideration.



### **Module 1 INTRODUCTION TO COMMUNICATION TOOLBOX**

1. Provide Algorithm and tools for Design, simulation and Analysis
2. Provide MATLAB functions, MATLAB System objects, and Simulink blocks.

3. Toolbox include algorithms for source coding, channel coding, interleaving, modulation
4. Provide bit error rate analysis, generating eye and constellation diagrams, visualization, etc.
5. Provide adaptive algorithms that let you model dynamic communications systems
6. Also support fixed-point data arithmetic and C or HDL code generation.

## **Module 2 MODULATION- DEMODULATION AND PLOT**

1. Baseband versus Passband Simulation
2. Digital Modulation Technique - ASK, FSK, PSK
3. QAM (Quadrature Amplitude Modulation), 16- QAM
4. Generate Random Binary Data stream
5. Gaussian Noise
6. Scatter Plot
7. Demodulation using 16-QAM
8. Constellation Diagram

## **Module 3 SYSTEM DESIGN**

1. Source Coding
2. Error Detection and Correction
3. Interleaving
4. Filtering
5. Synchronization
6. Equalization

## **Module 4 COMMUNICATION SYSTEM ANALYSIS**

1. Computing the BER curve
2. Automating performance analysis: scripts

3. Adding channel coding
4. Using BER Tool for performance analysis

## **Module 5 ILLUSTRATION OF ALGORITHMS**

1. Implementation of Spread Spectrum Techniques using Matlab
2. Implementation of Multi Carrier TDMA system using MATLAB
3. Implementation of Multi Carrier FDMA system using MATLAB
4. Implementation of Inter-Symbol (ISI) using MATLAB
5. Implementation of Shifting a given sequence using MATLAB
6. Implementation of Channel Coding and Decoding using MATLAB
7. Implementation of folding a given sequence using MATLAB