# 3rd Year Even Semester

**ETE 300: Electronic Project Design and Development**
Credit: 1.50 Contact Hours: 3.00 Hours/Week
Design and development of electronic project based on the subjects taught in the previous semesters.

**ETE 315: Information Theory**
Credits: 3.00 Contact Hours: 3 Hours/Week
Introduction to Information Theory, Information Rate and Shannon's Theory. Application of Information Theory. Codes for Source and Channels. Probability Distribution and Discrete source and Channels. Discrete Noiseless Channels. Capacity of Discrete Noiseless Channels. Codes for Data Translation. Information Content of Discrete Sources. Entropy function. Prefix and Block Codes for Data Compaction. Neyman-Pearson Theorem. Notch Filter. Discrimination Function. Elementary bounds on Performance. Discrete Noisy Channels. Mutual Information Function. Transmission of Information. Capacity of Discrete Noisy Channels. Block Codes for Data Transmission. Random Coding Bound. Transmission at Rates above Capacity. Compression of information. Information Content of Compressed data. Continuous Amplitude Signals. Information Measures of Gaussian signals. Gaussian Channels and Sources without and with Memory. Gaussian Waveform Channels and Sources. Bit Energy and Bit Error Rate. Signalling with and without Bandwidth Constraint.

**ETE 309: Digital Signal Processing**
Credits: 3.00 Contact Hours: 3 Hours/Week
Introduction: Digital Signal Processing and its benefits: Key DSP Operations, Real-time signal processing, Applications. Discrete Transform: Fourier series, DFT, FFT and other discrete transforms, Z- transforms and its applications in signal processing, correlation and convolution with examples. Filters: FIR, IIR and adaptive filters. An overview of spectrum estimation and analysis.

**ETE 310: Sessional Based on ETE 309**
Credit: 0.75 Contact Hours: 1.50 Hours/Week
Laboratory based on Digital Signal Processing (ETE 309)

**ETE 311: Digital Communication**
Credits: 3.00 Contact Hours: 3 Hours/Week
**Introduction:** Communication channels, mathematical model and characteristics. Probability and stochastic process.

**Source Coding:** Mathematical models of information, entropy, Huffman code and linear predictive coding.
**Digital Transmission System:** Base band digital transmission, inter-symbol interference, bandwidth, power efficiency, modulation and coding trade-off.
**Receiver for AWGN Channels:** Correlation demodulator and maximum likehood receiver.
**Channel Capacity and Coding:** Channel models and capacities and random selection of codes.
**Block Codes and Conventional Codes:** Linear block codes, convolution codes and coded modulation. Spread spectrum signals and system.

**ETE 312: Sessional Based on ETE 311**
Credit: 0.75 Contact Hours: 1.50 Hours/Week
Laboratory based on Digital Communication (ETE 311)

**ETE 323: Antennas and Propagation**
Credits: 3.00 Contact Hours: 3 Hours/Week
**Fundamental of Antennas:** Radiation Mechanism, Radiation Patterns, Lobes, Power Density and Intensity, Directive Gain and Directivity, Power Gain, Bandwidths, Radiation Efficiency, Input Impedance, Effective Aperture and Antenna Temperature.
Vector Potential Functions, Electric and Magnetic Fields for Electric and Magnetic Current Sources, Solution of Vector Potential Wave Equation, Duality, Reciprocity and Reaction Theorems. Linear Wire and Loop Antennas: Infinitesimal, Small, Finite Length and Half-wave Length Dipoles, Determination of Radiation Fields, Radiation patterns, Radiation Resistance, Directivity and Input Impedance of Dipoles, Mutual Impedance Between Linear Elements near Infinite Planes Conductors and Ground Effects. Circular, Square, Triangular, Rectangular, Rhombic and Ferrite loop antennas. Cylindrical dipole, Folded dipole, Matching techniques, Baluns and transformers.
**Antenna Arrays:** Two-Element Array, N-element Linear Arrays: Broad-side, End-fire, Phased, Binomial, Dolph- Tchebyschef and Super-directive Arrays, Determination of Array Factor and Patterns, Planar and Circular Arrays.
**Travelling-Wave and Broad-band Antennas:** Long wire, V, Rhombic and Helical Antennas, Yagi, Uda array, Frequency Independent and Log-periodic Antennas.
**Aperture, Reflector and Lens Antennas:** Huygens's Principle, Rectangular and Circular Apertures, Microstrip Antennas.
Babinet's Principle, Sectoral, Pyramidal and Conical Horns, Parabolic and Cassegrain Reflector Antennas, Lens Antennas.

**ETE 324: Sessional Based on ETE 323**
Credit: 0.75 Contact Hours: 1.50 Hours/Week
Laboratory based on Antennas and Propagation (ETE 323)

**EEE 351: Microprocessor and Microcomputer**
Credits: 3.00 Contact Hours: 3 Hours/Week
**Microcomputer Architecture:** Basic microcomputer blocks, microcomputer bus structure.
**Microprocessor Architecture:** Generalized microprocessor architecture. Basic concepts of 8085. Details study of 16-bit Intel 8086 microprocessor architecture and pin diagram. Familiarization with Z80, MC 68000, 80286 andPentium Series.
**Microcomputer Programming:** Introduction to machine and assemble language programming. Detail study of 8086 instruction sets with assembly language programming examples. Memory subsystem: Memory Module design Intel 8086 family memory IC's and interfacing them with microprocessor. Familiarization with different memory technology.
**I/O Subsystem:** Introduction to parallel and Serial I/O. Detail study of Intel 8086 family chips and interfacing them with microprocessor. Comparison of the architecture based on hardware features such as addressing modes interrupt structures, instruction execution, multiprogramming abilities and memory management.
**Microprocessor interfacing:** Introduction to some available microprocessor peripheral IC's and their application; Timing diagram, Interrupts, I/O Systems, DMA- based data transfer, memory interfacing, A/D and D/A converter interfacing; introduction to microcomputers.

**EEE 352: Sessional Based on EEE 351**
Credit: 1.50 Contact Hours: 3.00 Hours/Week
Laboratory based on Microprocessor and Microcomputer (ETE 351)