2nd Year Even Semester

EEE 224: Sessional Based on EEE 223
Credit: 0.75 Contact Hours: 1.50 Hours/Week
Laboratory based on Electrical Machines (EEE 223)

ETE 209: Design and Analysis of Signal and Systems using MATLAB
Credits: 3.00 Contact Hours: 3 Hours/Week
Basic system representation and use of MATLAB. System properties and system modeling. Difference equations. Convolution (discrete- and continuoustime). Fourier series and Fourier transforms. Frequency response, sampling and signal reconstruction. Discrete-time Fourier transforms and discrete Fourier transform.

ETE 210: Sessional Based on ETE 209
Credit: 0.75 Contact Hours: 1.50 Hours/Week
Laboratory based on Design and Analysis of Signal and Systems using MATLAB (ETE 209)

EEE 271: Instrumentation
Credits: 3.00 Contact Hours: 3 Hours/Week
Measuring Instruments: Electromechanical and electronic meters, their uses. Panel metering. Extension of Instrument range.
Transducers: Different types of transducers and their principle of operations: Position and displacement Transducers, Potentiometer, Linear variable differential transformers (LVDT), Pressure transducer, Temperature transducer, Optical transducer, Flow transducer, Strain gauge transducer, Ultrasonic transducer; Humidity transducer, Hall Effect transducer, and Speed transducer.

EEE 272: Sessional Based on EEE 271
Credit: 1.50 Contact Hours: 3.00 Hours/Week
Laboratory based on Instrumentation (EEE 271)

ETE 211: Communication Theory
Credits: 3.00 Contact Hours: 3.00 Hours/Week
Overview of communication system: Basic principles, fundamental elements, system limitations, message source, bandwidth requirements, transmission media types, bandwidth and transmission capacity. Noise: Source, characteristics of various types of noise and signal to noise ratio. Communication systems: Analog and digital. Continuous wave modulation:

Transmission types- base-band transmission, carrier transmission; amplitude modulation- introduction, double side band, single side band, vestigial side band, quadrature; spectral analysis of each type, envelop and synchronous detection; angle modulation- instantaneous frequency, frequency modulation (FM) and phase modulation (PM), spectral analysis, demodulation of FM and PM. Pulse modulation: Sampling- sampling theorem, Nyquist criterion, aliasing, instantaneous and natural sampling; pulse amplitude modulationprinciple, bandwidth requirements; pulse code modulation (PCM)- quantization principle, quantization noise, non-uniform quantization, signal to quantization error ratio, differential PCM, demodulation of PCM; delta modulation (DM)- principle, adaptive DM; line coding- formats and bandwidths. Digital modulation: Amplitude-shift keying- principle, ON-OFF keying, bandwidth requirements, detection, noise performance; phase-shift keying (PSK)- principle, bandwidth requirements, detection, differential PSK, quadrature PSK, noise performance; frequency-shift keying (FSK)- principle, continuous and discontinuous phase FSK, minimum-shift keying, bandwidth requirements, detection of FSK. Multiplexing: Time division multiplexing (TDM)- principle, receiver synchronization, frame synchronization, TDM of multiple bit rate systems; frequency-division multiplexing (FDM)- principle, de-multiplexing; wavelength-division multiplexing multiple-access network- time-division multiple-access (TDMA), frequency-division multiple access (FDMA); codedivision multiple-access (CDMA) - spread spectrum multiplexing, coding techniques and constraints of CDMA. Communication system design: design parameters, channel selection criteria and performance simulation.

ETE 212: Sessional Based on ETE 211
Credit: 0.75 Contact Hours: 1.50 Hours/Week
Laboratory based on Communication Theory (ETE 211)

ETE 221: EM fields and Waves
Credits: 3.00 Contact Hours: 3 Hours/Week
Coordinate System: Introduction to coordinate systems, transformations between coordinate systems.
Electrostatic Field: Coulomb's force law, Electric fields due to various charge distribution. Electric flux density, Gauss's law, application of Guass's law, divergence theorem. Definition of potential difference and potential, the potential field due to various charge distribution, conservative property, potential gradient, the dipole, Energy density in the electrostatic field. Current and current density, continuity of current, metallic conductors, conductor properties and bounded conditions, the nature of dielectric materials, capacitance. Boundary condition. Poison's and Laplace's Equations, Uniqueness theorem, Examples of the solution of Laplace's equation, examples of the solution of poison, product solution of Laplace's equation.
Magnetostatic Field: Biot Savart's Law, Amperes circuit law, curl, stoke's

theorem, Magnetic flux and magnetic flux density, the scalar and vector magnetic potentials, derivation of steady magnetic field laws. Force on a moving charge, force on a differential current element, force between differential current element, force and torque on a closed circuit, the nature of magnetic materials, Magnetisation and permeability, magnetic boundary conditions, the magnetic circuit, potential energy and forces on magnetic materials, inductance and mutual inductance.
Time Varying Fields and Maxwell's Equations: Faraday's Law, displacement current, Maxwell's equation in point form, Maxwell's equation in integral form, the related potentials.
The Uniform Plane Wave: Wave motion in free space, wave motion in perfect dielectric, plane waves in loose dielectrics. The Pointing vector and power considerations, propagation in good conductors, skin effect, reflection of uniform plane waves standing wave ratio.

Math 253: Engg. Mathematics-IV
Credits: 3.00 Contact Hours: 3 Hours/Week
Complex Variable: Complex number system, General functions of a complex variable, Limits and continuity of a function of complex variable and related theorems; Complex differentiation and the Cauchy-Riemann equations, Mapping by elementary functions, Line Integral of a complex function, Cauchy's Integral theorem, Cauchy's Integral formula, Liouville's theorem, Taylor's theorem and Laurent's theorem. Singular points, Residue, Cauchy's Residue theorem. Evaluation of residues, Contour integration, Conformal mapping.
Statistical Analysis: Frequency distribution; Mean, Median, Mode and other measures of central tendency; Standard deviation and other measures of dispersion; Moments skewness and kurtosis; Elementary probability theory and discontinuous probability distributions (Binomial, Poisson and negative binomial); Characteristics of distributions; Elementary sampling theory; Estimation; Hypothesis testing and regression analysis.