2nd Year Even Semester

EEE 2203 Electronics III
Contact hours/week: 3 Credits:3
Wave shaping: Linear and non-linear wave shaping, Clipping and Clamping circuits, Non Linear function circuits.
Negative resistance switching circuits. Timing circuits; Bi-stable, mono-stable and Astable multivibrators, Sweep and staircase generator, IC 555 and its application.
Application of op-amp in timing circuits, Comparators, Schimtt's Trigger. Pulse generator, VCO, PLL, Blocking oscillators.

EEE 2204 Electronics III Sessional
Contact hours/week: 3 Credits:1.5
Sessional based on the theory of course of EEE 2203.

EEE 2205 Electrical Machine II
Contact hours/week: 3 Credits:3
DC Generators: Types, no-load voltage characteristics, build up of a self excited shunt generator, load-voltage characteristic, effect of speed on no-load and load characteristics and voltage regulation, armature reaction.
DC Motor: Operating principle, counter emf, torque, speed, torque-speed characteristics, starting, braking, and speed control.
Synchronous Generator: Windings, excitation systems, equivalent circuit, vector diagrams at different loads, factors affecting voltage regulation, synchronous impedance, synchronous impedance methods of predicting voltage regulation and its limitations. Parallel operation: necessary conditions, synchronizing, circulating current and vector diagram.
Synchronous Motor: Operation, loading effect, effect of changing excitation, V-curves, and starting methods.

EEE 2206 Electrical Machine II Sessional
Contact hours/week: 3 Credits:1.5
Sessional based on the theory of course EEE 2205.

EEE 2211 Measurement & Instrumentation
Contact hours/week: 3 Credits:3
Introduction : Methods of measurement. Statistical method applied to field of measurement and error analysis and
calibration.
Resistance, Inductance and Capacitance measurements: Different methods of measuring high, medium and low

resistances. Methods of measuring self and mutual inductance and capacitance measurement. A.C. and DC bridge methods, Measurement of insulation and earth resistances. Localization of cable fault.

Magnetic measurement: Flux meter, Flux and Flux density measurement. Determination of iron losses and their separation.

Measuring instruments : Classification of measuring instruments. Ammeter, Voltmeter, wattmeter, AVO meter, Energy meter, Ampere-hour meter and Maximum demand meter for measuring AC and DC quantities. Speed, frequency and phase difference measurements. Illumination measurement.

Electronic measuring instruments: Digital instruments, VTVM, Q-meter and CRO.

Instrumentation : Extension of instrument range. Use of C.T. and P.T and calculation of their burden, Instrumentation of substation.

Measurement of non-electrical quantities: Transducer. Measurement of temperature, pressure, displacement, velocity, acceleration. Strain gauge and their applications.

EEE 2212 Measurement & Instrumentation Sessional
Contact hours/week: 3 Credits:1.5
Sessional based on the theory of course EEE 2211.

EEE 2213 Digital Electronics I
Contact hours/week: 3 Credits:3
Analysis and Synthesis of Digital Logic Circuits: Number system, codes, and conversion. Boolean algebra, De Morgan's law, logic gates and truth tables, combinational logic design, minimization techniques, implementation of basic static logic gates in CMOS and BiCMOS. Arithmetic and data handling logic circuits, decoders and encoders, multiplexers and combinational circuit design.
Programmable Logic Devices: Logic arrays, Field Programmable Logic Arrays and Programmable Read Only Memory.
Sequential Circuits: Different types of latches, flip-flops and their design using ASM approach, timing analysis, timing analysis and power optimization of sequential circuits. Modular sequential logic circuit design: Shift registers, counters and their applications.

EEE 2214 Digital Electronics I Sessional
Contact hours/week: 3/2 Credits:0.75
Sessional based on the theory of course EEE 2213.

Math 2201 Engineering Mathematics IV
Contact hours/week: 3 Credits: 3
Matrix: Definition of matrix, Different types of matrix, Algebra of matrix, Adjoin and inverse of a matrix, Elementary transformations of matrix, Matrix polynomials, Calay-Hamilton theory with uses of rank and nullity, Normal and canonical forms, Solution of linear equations, Eigenvalues and eigenvectors.
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.