

Level-2 Term-I (Common to all)

Sl. No	Course Number	Course Name	Contact Hours per Week	Credit Hour
1	EEE 201	Electronic Circuits I	3.0	3.0
2	EEE 202	Electronic Circuits I Laboratory	3.0	1.5
3	EEE 203	Energy Conversion I	3.0	3.0
4	EEE 211	Continuous Signals and Linear Systems	3.0	3.0
5	EEE 212	Numerical Technique Laboratory	3.0	1.5
6	MATH 259	Linear Algebra	3.0	3.0
7	HUM 135	English	3.0	3.0
8	HUM 272	Developing English Skills Laboratory	3.0	1.5
Total			24	19.5

EEE 201 Electronic Circuits I

3 Credit Hours, 3 Contact Hours per Week

Semiconductor diodes: semiconductor material and properties, pn junction, diode circuits: dc analysis and models, diode circuits: AC equivalent circuits, other diode types, single phase rectification and regulators, zener diode circuits, clipper and clamper circuits, multiple diode circuits, photo diodes and LED circuits, DC power supply; MOS Transistors: Structure of MOSFET, Current-Voltage Characteristics, MOS Device Models, DC circuit analysis, basic MOSFET applications, Biasing, constant current biasing, multistage MOSFET circuits, Junction Field effect transistor (JFET), MOSFET amplifier: basic transistor amplifier configurations-Common-Source, Common-Gate Stage, Source Follower (common drain); single stage integrated circuit MOSFET amplifiers, multistage amplifiers, basic JFET amplifiers; Bipolar Junction transistor (BJT): BJT, DC analysis of BJT circuits, basic transistor applications, biasing, multistage circuits, BJT linear amplifiers-basic configurations, CE amplifiers, AC load lines, CC and CB amplifier, multistage amplifiers, power consideration; Frequency Response: Amplifier frequency response, system transfer function, frequency response: transistor amplifiers with circuit capacitors, frequency response-BJT, frequency response-FET, high frequency response of transistor circuits. Output stages and power amplifiers: power amplifiers, power transistors, classes of amplifiers, Class-A power amplifier, Class-AB push pull complimentary output stage.

EEE 202 Electronic Circuits I Laboratory

1.5 Credit Hours, 3 Contact Hour per week

In this course students will perform simulation study and experiments to verify practically the theories and concepts learned in EEE 201.

EEE 203 Energy Conversion I

3 Credit Hours, 3 Contact Hours per Week

Transformer: principle of operation, construction, no load and excitation current, behavior during loading, effect of leakage flux, ideal transformer, leakage reactance and equivalent circuit of a transformer, equivalent impedance, voltage regulation, per unit quantities, regulation, losses and efficiency, determination of parameters by tests, polarity of transformer windings, vector group, transformer parallel operation. Harmonics in excitation current, transformer inrush current, three phase transformer connections, three phase transformers, harmonic suppression in three phase transformer connection. Autotransformer, instrument transformers.

Three phase induction motor: rotating magnetic field, reversal of rotating magnetic field, synchronous speed, torque in induction motor, induction motor construction: squirrel cage, wound rotor; slip and its effect on rotor frequency and voltage, equivalent circuit of an induction motor, air gap power, mechanical power and developed torque, torque speed characteristic, losses, efficiency and power factor, classification, motor performance as a function of machine parameters, shaping torque speed characteristic and classes of induction motor, per unit values of motor parameters, determination of induction motor parameters by tests, methods of braking, speed control.

Induction generator: operation, characteristics, voltage build up, applications in wind turbine.

EEE 211 Continuous Signals and Linear Systems

3 Credit Hours, 3 Contact Hours per Week

Classification of signals and systems: signals- classification, basic operation on signals, elementary signals, representation of signals using impulse function; systems- classification. Properties of Linear Time Invariant (LTI) systems: Linearity, causality, time invariance, memory, stability, invertibility. Time domain analysis of LTI systems: Differential equations- system representation, order of the system, solution techniques, zero state and zero input response, system properties; impulse response- convolution integral, determination of system properties; state variable- basic concept, state equation and time domain solution. Frequency domain analysis of LTI systems: Fourier series- properties, harmonic representation, system response, frequency response of LTI systems; Fourier transformation- properties, system transfer function, system response and distortion-less systems. Applications of time and frequency domain analyses: solution of analog electrical and mechanical systems, amplitude modulation and demodulation, time-division and frequency-division multiplexing. Laplace transformation: properties, inverse transform, solution of system equations, system transfer function, system stability and frequency response and application.

EEE 212 Numerical Techniques Laboratory

1.5 Credit Hours, 3 Contact Hours per Week

Laboratory on numerical techniques using computer solution of differentiation and integration problems, transcendental equations, linear and non-linear differential equations and partial differential equations.

MATH 259 Linear Algebra

3 Credit Hours, 3 Contact Hours per Week

Introduction to systems of linear equations. Gaussian elimination. Definition of matrices. Algebra of matrices. Transpose of a matrix and inverse of matrix. Factorization. Determinants. Quadratic forms. Matrix polynomials. Euclidean n -space. Linear transformation from \mathbb{R}^n to \mathbb{R}^m . Properties of linear transformation from \mathbb{R}^n to \mathbb{R}^m . Real vector spaces and subspaces. Basis and dimension. Rank and nullity. Inner product spaces. Gram-Schmidt process and QR-decomposition. Eigenvalues and eigenvectors. Diagonalization. Linear transformations. Kernel and Range. Application of linear algebra to electric networks.

HUM 135 English

3 Credit Hours, 3 Contact Hours per Week

General discussion: Introduction, various approaches to learning English.

Grammatical Problems: Construction of sentences, grammatical errors, sentence variety and style, conditionals, vocabulary and diction.

Reading Skill: Discussion readability, scan and skin reading, generating ideas through purposive reading, reading of selected stories.

Writing Skill: Principles of effective writing; Organization, planning and development of writing; Composition, precis writing, amplification.

General strategies for the writing process: Generating ideas, identifying audiences and purposes, construction arguments, stating problems, drafting and finalizing.

Approaches to Communication: Communication today, business communication, different types of business communication.

Listening Skill: The phonemic systems and correct English pronunciation.

Speaking Skill: Practicing dialogue; Story telling; Effective oral presentation.

Report Writing: Defining a report, classification of reports, structure of a report, and writing of reports.

HUM 272 Developing English Skills Laboratory

1.5 Credit Hours, 3 Contact Hours per Week

Grammar: Tense, article, preposition, subject-verb agreement, clause, conditional and sentence structure.

Vocabulary building: correct and precise diction, affixes, level of appropriateness. Colloquial and standard, informal and formal.

Developing reading skill: Strategies of reading- skimming, scanning, predicting, inferencing; Analyzing and interpreting variety of texts; Practicing comprehension from literary and nonliterary texts.

Developing writing skill: Sentences, sentence variety, generating sentences; Clarity and correctness of sentences, linking sentences to form paragraphs, writing paragraphs, essays, reports, formal and informal letters.

Listening skill and note taking: Listening to recorded texts and class lectures and learning to take useful notes based on listening.

Developing speaking skill: Oral skills including communicative expressions for personal identification, life at home, giving advice and opinion, instruction and directions, requests, complains, apologies, describing people and places, narrating events.