10EN201 PROFESSIONAL ENGLISH I

Credits: 2:0:0

Course Objectives
To impart basic grammar skills with special thrust on framing sentences for day to day conversation.
To train the students in language use and help improve their vocabulary.
To train the students in reading and writing skills

Unit I
Developing basic skills in Grammar- Parts of Speech- Tense forms- Concord- Articles-Voice-Infinitives- Gerunds—Modal auxiliaries- Understanding vocabulary- Word power.

Unit II
Developing skills in basic sentence patterns- Direct and indirect speech - Homophones- Note-Making- Paragraph writing- Personal letter writing- Summarizing- Punctuations- Discourse markers.

Unit III
Error Analysis- Descriptive writing- Abbreviations- Word formations- Cohesive devices- One-word substitution- Subordinating conjunction- Co-relative conjunction- Relative pronouns-Writing short speeches.

Unit IV
Instructions- Warning- Group discussions- - Writing minutes- writing recommendations- Memo writing- Understanding biography

Unit V
Essay writing- Writing official letters- If- clauses- Technical and non- technical meaning of words- Presentational skills- Body language- Role-play

Text Book

Reference Books
EN 214 BASIC FRENCH LANGUAGE

Credits: 2:0:0

Unit I
Nouns and Pronouns- Personal pronouns – Verbs- Concord – Present of regular verbs – present of frequently used verbs – direct infinitive to show preferences

Unit II
Adjectives– Types of adjectives and usage - Adverbs – use and position of frequently used adverbs - Prepositions and Conjunctions– use of prepositions of place

Unit III
Interrogative Constructions – questions indicated by rising intonation – questions starting with question words - Sentence Structure

Unit IV
Listening Skill – Pronunciation – Contextual meaning – Listening to comprehend ideas

Unit V
Reading a variety of short, simple materials – Demonstrate understanding through oral and brief written responses – Writing short expressions

Reference:
1. The Ontario Curriculum: FSL — Extended French, Grades 1–8; French Immersion, Grades 1–8, 2001

EN 216 BASIC GERMAN LANGUAGE

Credits: 2:0:0

Unit I
Introduction – Alphabets – Greetings – Countries and Languages – Pronouns – Possessive Pronouns - Verbs and their conjugations – Articles

Unit-II

Unit – III
Number system – Family – Daily routines related verbs and question verbs.

Unit – IV
Accusative and dative declensions of pronouns and articles – Modal verbs and their related grammatical structure.

Unit – V
Time and time related particles – Related vocabulary and grammar – Exercises.
Reference Books
1. Tangram Aktuell! (Max Hueber Verlag).
2. Pingpong (Maz hueber Verlag)

10EN202 PROFESSIONAL ENGLISH II

Credits: 2:0:0

Course Objectives
To impart skills in language use.
To enrich the vocabulary of students.
To enable students identify errors and frame error-free sentences
To impart reading and writing skills

Unit I
Language use-Word formation-Synonyms-Antonyms- Vocabulary building- Word Power-
Abbreviations-Acronyms-homophones.

Unit II
Language use-Error Analysis-Impersonal passive voice-Punctuations-Verb forms-Modal
Auxiliaries- Reading Skills-Extensive Reading-Intensive Reading.

Unit III
Communicative Skills-Prepositional Phrases-Gerunds-Infinitives-Imperatives-Situational
speech-practice to speak fluently-Contextual use of words-Language for various communicative
functions

Unit IV
Speaking Skills- Phonetics-Vowels - Consonants-Stress-Intonation- Phonetic Transcription-
Correct pronunciation Identification-Speeches-Group Discussion.

Unit V
Writing Skills-Creative writing - Continuous writing-Description- Parts of business letters-Types
of Business letters-Formatting of Business Letters - Editing

Text Book:

Reference Books
1. Joseph, Maya and Sundarsingh, J. ed. Communication Skills I & II. Coimbatore,
2. Radhakrishnan, Pillai G.et.al. (2000). Spoken English for You-Level I. Chennai:
Emerald Publishers.
MA244 ALGEBRA, DIFFERENTIAL CALCULUS AND ANALYTICAL GEOMETRY

Credits: 3:1:0

Unit I: Theory of Equations
Relations between coefficients and roots. Irrational and imaginary roots – symmetric functions of the roots – transformation of equations – Reciprocal equations and formation of equation whose roots are given.

Unit II: Matrices
Characteristic equation – Eigen values and eigenvectors of a real matrix – Properties of Eigen values – Cayley Hamilton theorem – Orthogonal reduction of a symmetric matrix to diagonal form – Orthogonal matrices – Reduction of quadratic form to canonical form by orthogonal transformation

Unit III: Three Dimensional Analytical Geometry
Direction cosines and ratios – Angle between two lines – Equation of a plane – Equation of a straight line – Co-planar lines – Shortest distance between skew lines

Unit IV: Geometrical Applications of Differential Calculus
Curvature – Cartesian and polar co-ordinates – Circle of curvature – involutes and Evolutes – Properties of envelopes – Evolutes as envelope of normals.

Unit V: Functions of Several Variables

Text Book:

Reference Books:
MA245 MULTIPLE INTEGRALS, DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS

Credits: 3:1:0

Unit I: Multiple Integrals
Evaluation of Multiple Integrals, Change of order of Integration, Application of Multiple Integrals to find area enclosed by plane curves and volume of solids.

Unit II: Beta and Gamma Integrals
Definition, relation connecting Beta and Gamma integrals, properties, evaluation of definite integrals in terms of Beta and Gamma functions.

Unit III: Ordinary differential Equation
Simultaneous linear equations with constant coefficients – Linear equations of higher order with constant coefficients – Homogeneous equation of Euler type – Method of variation of parameters.

Unit IV: Vector Calculus
Gradient, Divergence, Curl – Line, surface & volume integrals – Statements of Green’s, Gauss divergence and Stokes’ theorems (without proof) – verification and applications.

Unit V: Laplace Transforms
Transforms of simple functions – Basic operational properties – Transforms of derivatives and integrals – Initial and final value theorems – Inverse transforms – Convolution theorem – Periodic function – Applications of Laplace transforms of solving linear ordinary differential equations upto second order with constant coefficients and simultaneous equations of first order with constant coefficients.

Text Book:

Reference Books:

PH105 APPLIED PHYSICS

Credits: 3:0:0

Unit I:
Particles and waves
Shroedinger’s wave equation (Time dependant and time independent equations)- Applications: particle in a box,

**Unit II:**
**Structure of solids**
Classification of solids-Fundamental terms of crystallography-Lattice, basis, Unit cell, Crystallographic axis, primitives-Types of crystals-Bravais Lattices, miller indices-Unit cell characteristics of Simple cubic, BCC, FCC and HCP systems.

**Nano Materials**
Preparation of Nano Materials-Bottom up, top down approaches-Properties and applications of Carbon nano tubes

**Unit III:**
**Dielectrics**
Basic Definitions-Electric field intensity, Electric flux density, Dielectric parameters- dielectric constant- Experimental determination of dielectric constant- Dipoles – Dipole moment- polar and non polar dielectrics, polarization- Types of polarization- Internal field-clausius mosotti equation-Dielectric loss- dielectric breakdown- dielectric properties.

**Semiconductors:** Classification of solids on the basis of band theory- Conductors, Insulators and semiconductors. Classification of semiconductors-Intrinsic and Extrinsic semiconductors - Solar cells-Light emitting diodes-Liquid crystal display

**Unit IV**
**Lasers**

**Fibre optics:** Principle of optical fibre-Propagation in optical fibres-Acceptance angle- Numerical aperture-Structure of optical fibres-Fibre optic materials-Classification of optical fibres-Applications-Optical fibres for communication-Fibre optic sensors-Temperature sensor

**Unit V**
**Acoustics**
Classification of sound, Characteristic of musical sound-Loudness- Weber and Fechner’s law-Decibel- Absorption coefficient- Reverberation time- Sabine’s formula (growth and decay), Factors affecting acoustics of buildings and their remedies

**Ultrasonics-classification:** of ultrasonic waves-properties of ultrasonic waves- ultrasonic production- Magnetostriiction and piezoelectric methods, Acoustic grating, SONAR, NDT, applications in medicine and industry

**Recommended Text Book**

**Reference Books:**
09PH101 APPLIED PHYSICS LAB

Credits: 0:0:2

Course Objective:

- To train engineering students on basis of measurements and the instruments
- To give practical training on basic Physics experiments which are useful to engineers
- To equip the students with practical knowledge in electronic, optics, and heat experiments

Course outcome:
Demonstrate the practical skill on measurements and instrumentation techniques of some Physics experiments.

List of experiments:

1. Rigidity Modulus of the wire - Torsional Pendulum
2. Young’s Modulus of a beam- Non-uniform bending
3. Thermal Conductivity of a bad conductor-Lee’s Disc
4. Radius of curvature of a lens – Newton’s Rings
5. Refractive Index of Prism-Spectrometer
6. Wavelength of mercury source- Spectrometer Grating method
7. Coefficient of Viscosity of a liquid by Poiseullie’s method
8. Frequency determination of a tuning fork- Melde’s string
9. Particle size measurement-Laser diffraction method
10. Discharge of a capacitor
11. Thickness of a glass plate- Single optic lever
12. Characteristics of Zener diode
13. Efficiency of Solar cell
14. Ultrasonic interferometer

HoD can choose any 10 experiments from the above list at the beginning of the course in each Semester.

10PH201 - ENGINEERING PHYSICS

Credits: 2:0:0

Course Objectives:
- To help to prepare the Engineering students, a stronger foundation in the classical physics and Dynamics of particles
• Greater emphasis through on the role of reference frames in Newton’s laws, force laws
• A clear analysis of the concepts of Heat, Energy and laws of Thermodynamics (quantitatively).
• To provide the understanding of concepts of electricity and magnetism.

Course Outcome:
Student understands the classical portions of the Electricity and Magnetism and special momentum to Electromagnetic introduction

Unit I : Particle Dynamics

Unit II Heat And Thermodynamics
Heat And Work, The First, Second and Third laws Of Thermodynamics, Some Applications

Unit III : Magnetism

Unit IV: Electrostatics
Electric Field And Electric Intensity, Electrostatic Potential, Gauss’s Theorem, Applications Of Gauss’s Theorem, Mechanical Force Experienced By Unit Area Of A Charged Field, Electrostatic Potential At A Point Due To A Dipole

Unit V : Electromagnetic Induction

Text Books:
2. Electricity & Magnetism, Brijlal & Subramaniam S. Chand and Co 2004

Reference Books:
1. University Physics, Sears and Zemansky –Pearson Addison Wesly,2007
2. Fundamentals of Physics, an introductory course, David G. Martindale, Robert W. Heath, D.C. Heath, Canada, 1987
4. Electricity and Magnetism, William C. Robertson, NSTA press, 2005
CH106 APPLIED CHEMISTRY

Credits: 3:0:0

Unit I: High Polymers

Unit II: Water Technology

Unit III: Fuels and Combustion

Unit IV: Electrochemistry

Unit V: Emerging Trends in Chemistry
Text Book:

Reference Books:
1. S. Glasstone and D. Lewis – “Elements of Physical Chemistry”, McMillan Co. of India Ltd., 2002

09CH104 – APPLIED CHEMISTRY LAB

Credits: 0:0:2

Objectives:
1. To understand the principles of estimation in acidimetry, alkalimetry and permanagnometry titrations
2. To understand gravimetric principles involved in complexometric titration
3. To understand the principles of potentiometry, conductometry and pH measurements
4. To understand the principles of spectrophotometry and flame photometry

List of Experiments:
1. Estimation of Hydrochloric acid
2. Estimation of Sodium Hydroxide
3. Estimation Fe^{2+} ions
4. Estimation of total, permanent and temporary hardness of Water Sample
5. Estimation of alkalinity in water sample
6. Estimation of dissolved oxygen
7. Estimation of Iron in water sample by spectrophotometry
8. pH measurements for acid – alkali titration
9. Conductometric estimation of an acid
10. Potentiometric estimation of Fe^{2+} Ions
11. Determination of single electrode potential by potentiometry
12. Determination of rate of corrosion of mild steel by by weight loss method
13. Estimation of sodium present in water by flame photometry
09CH201 – ENVIRONMENTAL STUDIES

Credits: 3:0:0

Objectives:
1. To acquire the knowledge of environmental studies, it’s need & importance
2. To understand the concept, structure and function of different ecosystems
3. To know about pollution problems and green technology
4. To develop a sense of responsibility about the role of students in fostering the idea of learning to live in harmony with nature

Unit I - Natural resources, ecosystems and biodiversity

Unit II – Air pollution and global issues

Unit III – Issues related to other environmental pollution aspects and green technology
Water pollution - sources – characteristics – BOD, COD - pollutants and their effects – heavy metal pollution – inorganic and organic pollutants control methods - Advanced waste water treatment techniques - Basic aspects of soil pollution - marine pollution - noise pollution - thermal pollution - nuclear hazards - Causes, effects and control measures - solid waste management: causes, effects and control measures of urban and industrial solid wastes
Green chemistry and green technology – principles of sustainable and green chemistry - miscelle templated silica as catalyst in green chemistry – biocatalysis – bioproduction of
catalysts in industries – basics of clean energy technology for the future – fuel cells, wind power, solar power

Unit IV – Environmental Legislation

Unit V – social issues and the environment

Text books:

Reference Books:

09ME101 BASIC MECHANICAL ENGINEERING

Credits: 2:0:0

Objective:
To provide knowledge about IC Engines, External combustion Engines, boilers, power plants, metal forming, metal joining, machining process and materials. To understand about CAD and modern design softwares in the mechanical engineering.
UNIT - I
Engine-External combustion engine – Working of Steam Engine – Steam Turbine –
Impulse turbine & reaction turbine – Boilers fire tube and water tube boiler – Cochran
boiler – Babcock & Wilcox boiler – Internal Combustion Engine – Working of petrol and Diesel
Engine – Difference between two stroke and four stroke engines.

UNIT - II
Conventional power plants – Hydro, Thermal, Nuclear power plants – Diesel and Gas
Turbine power plants; Non-conventional power plants – Solar, wind and tidal power
plants – Geothermal power plant – Ocean Thermal Energy conversion power plant.

UNIT - III
Load – Types of load –stress and strain – Types of stresses and strains – Stress strain curve of
ductile materials- Introduction of Mechanical Engineering Software Packages.

UNIT – IV
Metal casting and forming process – Introduction – advantages of casting – patterns –
welding, gas welding

UNIT –V
Nonferrous metals and alloys.

Text Books:

Reference Books:
1. I.E. Paul Degarmo, J.T. Black, Ronald A. Kosher, “Material and Processes in
2. Dr. O.P. Khanna, “A Text Book of Materials Sciences and Metallurgy”, Dhanpat

09EC218 BASIC ELECTRONICS

Credits: 3:0:0

Objective: To know the basics about semiconductor, integrated circuits and communication
system.
Outcome: Students will get overview about the basics of electronics.
UNIT I
Introduction to Semiconductor
Covalent bond – N type & P type semiconductor – conduction in semiconductor – semiconductor devices: diode, transistor, FET, MOSFET, UJT.

UNIT II
Integrated Circuits

UNIT III
Digital Systems
Number system – Boolean algebra – logic gates –truth table - combinational circuit -4 x 1 multiplexer – 1 x 4 demultiplexer - digital computer principles.

UNIT IV
Communication
Basic block of communication system – need for modulation – Derivation of AM and FM signal - Amplitude and Frequency Modulation (Balanced modulator and varactor diode modulator)- Demodulation(AM diode detector and balanced slope detector.

UNIT V
Communication systems
Block diagram of AM and FM transmitter - Superheterodyne receiver – satellite communication – Fibre optic communication

Text Book

Reference Books

09EE101 BASIC ELECTRICAL ENGINEERING

Credits: 3:0:0
Course Objectives
• To impart the basic knowledge about the Electric and Magnetic circuits.
• To inculcate the understanding about the AC fundamentals.
• To understand the working of various Electrical Machines.
• To know about various measuring instruments and house wiring.
Unit I: DC CIRCUITS

Unit II: MAGNETIC CIRCUITS

Unit III: AC FUNDAMENTALS

Unit IV: ELECTRICAL MACHINES
Working principle, operation and application of DC Generator, DC Motor, Transformer, Three Phase Induction motor, Single phase Induction motor, Alternator. (Quantitative approach)

Unit V: MEASURING INSTRUMENTS AND HOUSE WIRING
Wiring materials and accessories – Types of wiring – Fluorescent lamp wiring – stair case wiring – basic principles of earthing – layout for a residential building.

Course Outcome
After the completion of the course, the student should be able
- To predict the behavior of any electrical and magnetic circuits.
- To identify the type of electrical machine used for that particular application.
- To wire any circuit depending upon the requirement.

Text Book

Reference Books
CS101 PROGRAMMING IN C

Credits: 4:0:0

Unit I
Introductory Concepts - Introduction to Computers– What is a Computer – Block Diagram of Computer – Computer Characteristics – Hardware vs Software – How to Develop a Program – Modes of Operation – Types of Programming Languages – Introduction to C – Desirable Program Characteristics - Introduction to C Programming - The C Character Set – Writing First Program in C - Identifiers and Keywords – A More Useful C Program – Entering the Program into the Computer – Compiling and Executing the Program - Data Types – Constants – Variables and Arrays – Declarations – Expressions – Statements – Symbolic Constants (Chapters 1,2)

Unit II

Unit III

Unit IV

Unit V
Additional Features of C – Enumerations – Command Line Parameters (Chapters 11, 12, 14.1, 14.2)

**Text Book:**

**09CS217 PROGRAMMING IN C LAB**

**Credits: 0:0:2**
1. Write a Program to find the Palindrome.
2. Write a Program using switch statement with the multiple cases (Fibonacci Series, Factorial for the Given Number, Armstrong Number or Not, Prime or Not)
3. Sorting of Numbers Using Arrays
4. Printing 10 Numbers both in Ascending and Descending.
5. Pyramid
7. Counting Number of Characters, Number and Special Characters In Given String.
8. Student Record Using Structure.
9. Print Multiplication Table In Reverse Order Using For, While Do While.
11. Data Files
12. Data Files.

12 Experiments will be notified by the HOD from time to time. A tentative list is mentioned above.

**MA 246 COMPLEX ANALYSIS, STATISTICS AND Z-TRANSFORMS**

**Credit: 3:1:0**

**Unit I : Analytic Functions**
Cauchy Riemann equations – Properties of analytic functions – Determination of harmonic conjugate – Milne – Thomson’s method – Conformal mappings \( w = z + a \), \( az \), \( 1/z \), \( z^2 \), and bilinear transformation.

**Unit II: Complex Integration**
Cauchy’s theorem – Statement and application of Cauchy’s integral formulae – Taylor’s and Laurent’s expansions – Singularities – Classification – Residues – Cauchy’s residue theorem – Contour integration – Circular and semi Circular contours (excluding poles on real axis)

**Unit III: Statistics**
Moments, skewness and kurtosis (based on moments only) – Linear correlation-coefficient of correlation – rank correlation and regression lines – Theoretical Distributions – Binomial – Poisson – Normal.
Unit IV: Testing of hypothesis

Tests based on large samples - Small samples: t mean and difference of means – $\chi^2$ test for goodness of fit and attributes and F - distribution.

Unit V: Z – Transforms

Z-transforms of standard functions, inverse Z-transform (Partial fraction expansions and residues), properties of Z-transform, Solution of difference equations.

Text Book:

Reference books:

10EE201 ELECTRIC CIRCUITS AND NETWORKS

Credit: 3:1:0

Course Objective:

This Course will provide the students to
1. Develop an understanding of the fundamental elements of electric circuits.
2. Develop the ability to apply the basic theorems to analyze a DC and AC electric circuit.
3. Use mathematical methods such as Laplace and Fourier transforms and some linear algebra techniques and differential equations to solve circuits problems
4. Synthesize a network with stable condition.

Course Outcome:

At the end of this course, the student should be able to
1. Analyze simple circuits applying Ohm’s and Kirchhoff’s laws
3. Demonstrate the network parameters of a transmission cable.
4. Design any non linear network, filters and attenuators for an application

Unit I: Circuit Analysis


Unit II: Network Theorems

Superposition, Reciprocity, Substitution, Thevenin, Norton, and Maximum Power Transfer Theorems - Problems
Unit III: Transient Response of Electric Circuits

Unit IV: Coupled Circuits and Three Phase Circuits

Unit V: Two Port Networks and Filters
Driving point and transfer impedance/admittance - voltage and current ratios of two port networks - admittance, impedance, hybrid, transmission and image parameters for two port networks – impedance matching – equivalent π and T networks – passive filters as a two port network – characteristics of ideal filter – low pass and high pass filters.

Text Books:

Reference Books

EE247 ELECTRON DEVICES

Credits 3:1:0

Unit I: P-N Junction Diode
V-I characteristics - Static and Dynamic resistance, Temperature dependence of characteristics, diffusion and transition capacitances, Diode as a circuit element, small signal and large signal models. Elementary applications - Clippers and clamps, Diode switching times, PN junction diode ratings. Breakdown phenomena in diodes - Zener diodes. Metal - semiconductor junction - Schottky barrier diodes.
Unit II: Bipolar Junction Transistor (Bjt)
Physical behaviour of a BJT – Ebers - Moll model, large signal current gains, Modes of transistor operation - Common Base, Common Emitter and Common Collector configurations, Input and output characteristics, Early effect, regions of operation, AC and DC load lines - Need for stability of Q-Point, Bias stability – fixed bias, collector to base bias, self bias. Transistor switching times - Transistor as a switch and an amplifier, High frequency effects, BJT ratings. Introduction to photo transistors.

Unit III: Junction Field Effect Transistor (Jfet)
JFET operation - V-I characteristics, transfer characteristics, regions of operation. DC analysis - JFET biasing. Small signal JFET model, JFET as a switch, Voltage variable resistor and an amplifier.

Unit IV: Metal Oxide Semiconductor Field Effect Transistor (Mosfet)
Constructional details - Operation of Enhancement and Depletion type MOSFETs , V-I characteristics, Transfer characteristics, analytic expression for drain current, Comparison of PMOS and NMOS devices - MOSFET biasing, MOSFET as a switch, resistor and amplifier, Introduction to CMOS devices.

Unit V: Integrated Circuit (Ic) Fabrication
Monolithic IC technology - Planar processes, Epitaxial growth, Oxidation, Photolithography, Diffusion, Ion implantation, Metallization. BJT fabrication - need for buried layer, Junction and Dielectric isolation, Fabrication of PNP multiple emitter transistors, Monolithic diodes, Fabrication of FETs, NMOS enhancement and depletion MOSFETs, Self isolation, CMOS technology. Monolithic IC Resistors: sheet resistance - Diffused, Ion implanted, Epitaxial, pinch, MOS and thin film resistors, Monolithic IC capacitors - Junction, MOS and thin film capacitors, IC packaging, Micro-electronic circuit layout.

Text Books

Reference Books:

EE248 ELECTROMAGNETIC FIELDS
Credits 3:1:0

Unit I  General Principles

**Unit II Electrostatic Fields**

**Unit III Magnetostatic Fields**

**Unit IV Electromagnetic fields**

**Unit V Electromagnetic Waves**
Generation – Propagation of Waves in Dielectrics – Conductors and Transmission lines – Skin effect.-Power and the Poynting Vector.

**Text Books**

**References**
EE261 C++ AND DATA STRUCTURES

Credits 3:0:0

Unit I: Introduction to Data Structures
Linked list, Single linked list, Doubly linked list, Circular Linked list, Stack, Queue, Trees

Unit II: Sorting and Searching Techniques
Sorting, Bubble sort, Insertion Sort, Selection Sort, Quick Sort, Heap Sort, Merge Sort. Searching, Binary Tree Search, Linear Search, Binary Search.

Unit III: Objects and Classes
A Simple class, C++ objects as physical objects, C++ Objects and Data types, Object as function argument, constructors, as function argument, Overloaded Constructors, Copy Constructors, Returning objects from functions, structures and classes, Static class data, const and classes, Arrays and Strings.

Unit IV: Operator Overloading
Overloading Unary and Binary Operator, data conversion, and Pitfalls, Inheritance: derived class and base class, derived class constructors, Overloading member functions, class hierarchies, public and private inheritance, level of inheritance, multiple inheritance. Pointers: address and pointers, pointers and arrays, pointer and c-type strings, new and delete operator, pointers to pointer.

Unit V: Virtual Functions
Virtual functions, Friend functions, Static functions, this pointer. Streams and files: stream classes, stream errors, disk file I/O with streams, file pointers, error handling in file I/O. Templates and exception: function templates, class templates, exceptions.

Text Books

Reference Books:

10EN203 ADVANCED ENGLISH

Credits: 2:0:0

Course Objective
• To make the learners aware of the importance of correct English both in writing and speaking contexts
• To enable the learners to acquire the additional skills required to perfect their language competency

UNIT I
Role of language in communication - basics of communication – types and barriers — comparison of oral and written communication – error analysis in English grammar

UNIT II
Body language and communication in English – types of non-verbal communication – oral presentation exercises – telephone conversation – communication errors in English

UNIT III
Role of English in interviews - interview techniques – question types – interpersonal communication – vocabulary for specific interview situations

UNIT IV
Business letters: Enquiry letter, Quotation letter, Purchase letter & Sales letter – Sales advertisement – headline writing - overcoming errors in sentence construction

UNIT V

Text book:

Reference Books:
2 Raman, Meenakshi and Sharma, Sangeeta. Technical Communication: Principles and Practice. OUP: New Delhi, 2004

EE262 MEASUREMENTS AND INSTRUMENTATION

Credits 3:0:0

Unit I: Standards and Indicating Instruments
Unit II: Measurement of Power and Energy

Unit III: Measurement of R-L-C

Unit IV: Measurement of Non-Electrical Quantities

Unit V: Electronic Laboratory Instruments

Text Book

Reference Books

09EE213 CIRCUITS AND DEVICES LAB
Credits 0:0:2
1. Verification of Ohms and Kirchhoff’s law.
2. Verification of Superposition Theorem using PSPICE.
3. Verification of Thevenin and Norton Theorem using PSPICE.
4. Transient Response of a simple RL, RC and RLC circuits using PSPICE.
5. Resonance of series RL, RC and RLC circuits using PSPICE.
6. Filters using PSPICE.
7. Characteristics of PN diode & Zener diode
8. Characteristics of JFET
9. Characteristics of UJT & SCR
10. Input Output Characteristics of Transistor under CE configuration
11. Study of Half wave & Full wave Rectifier with and without filter
12. Non-Linear wave shaping techniques-Clipper and Clamper

EE278 C++ AND DATA STRUCTURES LABORATORY

Credits 0:0:2

12 Experiments will be notified by the HOD from time to time

MA247 FOURIER SERIES, TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS

Credit: 3:1:0

Unit I: Fourier series
Euler’s formula – Dirichlet’s conditions convergence statement only – change of interval odd and even functions. Half range series – RMS value, Parseval’s formula – complex form of Fourier series – harmonic analysis.

Unit II: Partial Differential Equations
Formation of equations by elimination of arbitrary constants and arbitrary functions – solution of equations – general, particular and complete integrals – Lagrange’s linear equation – standard type of first order equations – second order and higher order equations with constant coefficients, homogeneous and nonhomogeneous equations.

Unit III: One-Dimensional Wave Equations and Heat Equation
One dimensional wave equation – transverse vibration of finite elastic string with fixed ends – boundary and initial value problems – Fourier series solution. One dimensional heat equation – steady and unsteady states, boundary and initial value problems – Fourier series solution. (Proofs and derivations not needed)

Unit IV: Two Dimensional Heat Equation
Two dimensional heat equations – steady state heat flow in two dimensions – Laplace Equations in Cartesian and polar co ordinates Fourier series solution. (Proofs and derivations not needed)

Unit V: Fourier transforms

Text Books:

Reference Books:

EE250 DC MACHINES AND TRANSFORMERS

Credits 3:1:0

Unit I: Dc Generators
Laws of magnetic circuit – Principle of operation, Constructional details, Armature Windings, EMF equation, Methods of Excitation, Separate, Shunt, Series and Compound excitations - No load characteristics – Armature reaction, Commutation, Inter poles, Compensating windings, Load characteristics of various types of DC Generators.

Unit II: Dc Motors
Principle of operation – Torque equation, Electrical and Mechanical characteristics of DC Shunt, Series and Compound motors, Starters – Speed control – Armature and Field control – Braking.- Losses and efficiency – Swinburne’s test – Separation of losses, Hopkinson’s test.

Unit III: Transformers
Principle of operation – Constructional features, Classification of Transformers, EMF equation, Transformation ratio, Transformer on no load and load, Phasor diagrams - Equivalent circuit - Voltage regulation, Regulation curve, Losses, Efficiency, All Day efficiency

Unit IV Test on Transformer

Unit V: Three Phase Transformer

Textbooks

References

09EE201 ELECTRONIC CIRCUITS

Credits: 3:1:0

Pre requisite: EE 247 Electron Devices

COURSE OBJECTIVE
- The course is aimed to impart in-depth knowledge of Electronic circuits and its Characteristics
- Introduce about the different types of amplifiers.
- Gives the knowledge about the different wave shaping circuits.

Unit I POWER SUPPLIES

Unit II WAVE SHAPING
Response of High pass and Low pass RC circuit for sinusoidal, step, pulse, square, ramp and exponential inputs. Linear wave shaping – Integrator, Differentiator. Non-linear wave shaping–Clipping and clamping circuits, clamping circuit theorem and applications, Attenuator and compensated attenuator. Introduction to pulse transformers and applications.

Unit III VOLTAGE AMPLIFIERS

Unit IV POWER AMPLIFIERS AND FEEDBACK AMPLIFIERS
Power amplifiers– Classification, Class A/B/C, Single ended and Push-pull configuration, Power dissipation and output power, Conversion efficiency, Complementary symmetry power amplifiers, Class AB operation. Basic concepts of feedback amplifiers – Effect of negative feedback on input and output resistances, gain, gain stability, distortion and bandwidth. Voltage and current feedback circuits.

Unit V OSCILLATORS AND MULTIVIBRATORS
Course Outcome
On completion of course the students will be able to:

- Design and analyze the various amplifiers characteristics.
- Design the Oscillator circuits for various applications.
- Design the wave shaping circuits required for specific use.

Textbooks

Reference Books

EE259 CONTROL SYSTEMS

Credits: 3:1:0

Unit I Introduction
Open loop and Closed loop systems – Examples, Control system components. Transfer function of physical systems– Mechanical systems, Translational and Rotational systems, Electrical network, Thermal and hydraulic systems. Transfer function of DC Generator, DC servomotor, AC servomotor and Synchros , Transfer function of overall systems. Impulse Transfer function. Block diagram - reduction techniques. Signal flow graphs – Mason’ gain formula.

Unit II Time Response Analysis

Unit III Frequency Response Analysis
Frequency domain specifications – peak resonance, resonant frequency, bandwidth and cut-off rate, correlation between time and frequency responses for second order systems. Polar plot, Bode plot – Gain Margin and Phase Margin.

Unit IV Stability of Systems

**Unit V: State Variable Analysis**
Introduction to state space analysis – Physical variable, Phase variable and Canonical variables forms. Transfer function from state space representation.

**Text Books**

**Reference Books:**

**09EE202 DIGITAL ELECTRONICS**

Credits: 3:1:0
Pre requisite: EE 247 Electron Devices

**COURSE OBJECTIVE**
- To introduce the concepts of Boolean algebra,
- To make them familiar with the implementation of combinational logic functions.
- To make them understand about the working of counters and flip flops

**UNIT I: NUMBER SYSTEMS AND BOOLEAN ALGEBRA**

**UNIT II: COMBINATIONAL LOGIC DESIGN**
UNIT III: COUNTERS AND REGISTERS

UNIT IV: SEQUENTIAL LOGIC DESIGN
Basic models of sequential machines – concept of state table – state diagram – state reduction through partitioning & implementation of synchronous sequential circuits – Introduction to asynchronous sequential logic design.

UNIT V: PROGRAMMABLE LOGIC DEVICES
LOGIC FAMILIES: RTL, DTL, TTL families, Schottky – clamped TTL, Emitter Coupled Logic (ECL), Integrated Injection Logic (IIL), MOS inverters, CMOS inverters, Comparison of performance of various logic families.

Course Outcome
On completion of the course, the students will be able to
• Apply Boolean algebra & K –map to digital circuits
• Design combinational and Sequential circuits
• Design the logic families to specific applications.

Text Books

Reference Books

10VE201 VALUE EDUCATION

Credits: 2:0:0

Course Objectives:
1. To give an understanding of life in all its complexities and to provide practical opportunities and mold students to meet the needs of the people.
2 To sharpen the capacity of the student in enabling them to make right moral and ethical choices,
3 To develop professionals with social concern reaching out to the nation as leaders and serving the needy with divine grace and power.

UNIT-I
Introduction: Vision and Mission of Karunya. Value Education, Purpose and priority areas of Value Education. Importance of Values in Life – what is a Value system? Types of values, Value inculcation process, Clarifying values – Importance of Values in Life – what is a Value system? What kinds of values need to be inculcated eg. Ethical, moral and spiritual instead of materialistic values, value inculcation, trend of values such as a permissive culture. Character Building – advantages of good character, importance of trust, honesty, integrity, morality, and reliability as qualities of a good character. Building Relationship – Objectives, Ways to improve relationship, Issues that hinder relationship, Tools for effective relationship

UNIT- II
Personality Development- definition, types and ways to improve Personal effectiveness. Purpose and philosophy of Life – Learning the purpose driven life, Decision making skills, Introspection, Moralization of Desires. Leadership – Qualities of a good leader, Types and Principles. Communication – Principles and Types, advantages and disadvantages to communication. Communication skills

UNIT-III

UNIT – IV

UNIT – V
Reference Books:

10VE202 VALUE EDUCATION

Credits: 2:0:0

Course Objectives:

1 To give an understanding of life in all its complexities and to provide practical opportunities and mold students to meet the needs of the people.
2 To sharpen the capacity of the student in enabling them to make right moral and ethical choices,
3 To develop professionals with social concern reaching out to the nation as leaders and serving the needy with divine grace and power.

UNIT-I
Introduction: Vision and Mission of Karunya. Value Education, Purpose and priority areas of Value Education. Importance of Values in Life – what is a Value system? Types of values, Value inculcation process, Clarifying values Importance of Values in Life – what is a Value system? What kinds of values need to be inculcated eg. Ethical, moral and spiritual instead of materialistic values, value inculcation, trend of values such as a permissive culture. Character Building – Advantages of good character, Importance of trust, honesty, integrity, morality, and reliability as qualities of a good character. Building Relationship – Objectives, Ways to improve relationship, Issues that hinder relationship, Tools for effective relationship

UNIT-II
Personality Development– Definition, Types and ways to improve Personal effectiveness. - Purpose and philosophy of Life – Learning the purpose driven life, Decision making skills, Introspection, Moralization of Desires. Leadership – Qualities of a good leader, Types and Principles. Communication – Principles and Types, advantages and disadvantages to communication. Communication skills

UNIT-III
UNIT – IV

UNIT – V

Sin and Temptation – nature and sources of sin, Ways to overcome temptation.

Inner Life Integrity – Understanding Personality, Self-centered and Christ-centered Personality, Integrity in Time, Talent and Treasures.

Reference Books:


09EE214 DC MACHINES AND TRANSFORMERS LABORATORY

Credits 0:0:2
1. Load characteristics of a separately excited DC Generator.
2. Load characteristics of DC Shunt Generator
3. Load characteristics of DC Compound Generator
4. Load test on DC Shunt Motor
5. Load test on DC Series Motor
6. Speed control of DC Shunt Motor
7. Electric Braking of DC Shunt Motor
8. Swinburne’s Test
9. Load test on Single Phase Transformer
10. Open circuit and Short circuit test on Single Phase Transformer
11. Sumpner’s Test on a Single Phase Transformer.
12. Three Phase Transformer Connections
09EE216 ELECTRONIC CIRCUITS LABORATORY

Credits 0:0:2
1. BJT Amplifier (CE)
2. JFET Amplifier (CS)
3. Differential Amplifier using BJT
4. Study of Half-Wave & Full-Wave Rectifiers (with and without Filter)
5. Integrator and Differentiator using R and C
6. Voltage Regulator (Series Type)
7. Emitter Follower
8. RC Phase-Shift Oscillator
9. Colpitts Oscillator
10. Astable Multivibrator
11. Bistable Multivibrator
12. Schmitt Trigger Circuit

EE251 INDUCTION AND SYNCHRONOUS MACHINES

Credits 3:1:0

Pre requisite: DC Machines and Transformers

Unit I: Three-Phase Induction Motors

Unit II Single-Phase Induction Motors

Unit III: Synchronous Generators

Unit IV: Synchronous Motors
Unit V: Two Reaction Theory
Salient Pole machine analysis – Phasor diagrams – Voltage regulation – Power / Power angle relation – Determination of \( X_d \) and \( X_q \).

Textbooks

Reference Books:

EE258 LINEAR INTEGRATED CIRCUITS
Credits 3:1:0
Pre requisite: EE247 Electron Devices

Unit I: Operational Amplifier Characteristics
Functional Block Diagram – Symbol, Characteristics of an Ideal Operational Amplifier, Circuit schematic of \( \mu A \) 741, Open loop gain, CMRR-input bias and offset currents, input and output offset voltages, offset compensation techniques. Frequency response characteristics – stability, limitations, frequency compensation, slew rate. Transfer characteristics.

Unit II: Linear Applications of Operational Amplifiers

Unit III: Non Linear Applications of Operational Amplifiers:

Unit IV: IC Voltage Regulators & Special Function ICS:
Block diagram of 723 General purpose voltage regulator – Circuit configurations, Current limiting schemes, Output current boosting, Fixed and adjustable three terminal regulators, Switching regulators- SPECIAL FUNCTION ICs: 555 Timer Functional block diagram and
description – Monostable and Astable operation, Applications, IC566 Voltage Controlled Oscillator, Analog Multiplier, Comparator ICs, PLL Functional Block diagram – Principle of operation, Building blocks of PLL, Characteristics, Derivations of expressions for Lock and Capture ranges, Applications: Frequency synthesis, AM and FM detection, FSK demodulator, Motor speed control.

Unit V: A-D and D-A Converters
Digital to Analog Converters: Binary weighted and R-2R Ladder types – Analog to digital converters: Continuous, Counter ramp, Successive approximation, Single slope, Dual slope and Parallel types – DAC/ADC performance characteristics.

Text Books

References

09ME228 HEAT ENGINES AND FLUID MACHINERY

Credits: 3:1:0

Course Objective:
To provide knowledge about Fluid properties, pumps, turbines, basic concepts and laws of thermodynamics, I.C.Engines, Conduction, convection and radiation heat transfer

UNIT-I:
UNIT-II:
Turbine impulse momentum equation- moment of momentum equation (theory only) - turbine
Classification-working principles -pelton wheel, Francis, Kaplan turbines - velocity
triangles -draft tube- similarity laws - specific speed - governing of turbines- surge tanks.

UNIT-III
Basic concepts - thermodynamic system - properties - processes - cycle - equilibrium -first law
of thermodynamics - application of first law to non flow and flow process - second law of
thermodynamics - Kelvin Planck's statement -Clausius statement - reversibility - Carnot theorem
- heat engine - reversed heat engine - entropy.

UNIT-IV
I.C.Engine - air standard cycles - air standard efficiency - Otto, Diesel and Brayton cycles-
testing of IC Engines - performance curves, FHP determination, heat balance.

UNIT-V
Heat transfer - modes of heat transfer - steady state heat conduction - heat conduction with
internal heat generation - extended surfaces - fin - convection - empirical relations - Radiation -
laws of radiation - radiant heat transfer between two surfaces.

Text Books

Reference Books
Hill, New Delhi, 1997.

EE253 GENERATION ,TRANSMISSION AND DISTRIBUTION

Credits:  3:1:0

Unit I: Power Generation
Generation, Transmission & Distribution Scenario of India - Types of generation: Conventional
and Non-conventional, Thermal Power Plant, Hydro Power Plant, Gas Power Plant, Nuclear
Power Plant, Non-conventional Energy Sources - Load capacity factor - Connected load factor -
Load duration curve - Selection of units.

Unit II: Power Transmission Systems

Unit III: Line Insulators
Types - Potential distribution over a string of suspension insulators - Methods of increasing string efficiency. Corona – Factors affecting corona - Stress and Sag Calculation – Effect of wind and ice - supports at different levels – Stringing chart.

Unit IV: Underground Cables
Types - Capacitance and insulation resistance - Sheath effects - Grading - Stresses - Loss angle - Breakdown voltage - Optimum cable length -Comparison between Overhead lines and Underground cables.

Unit V: Distribution Systems
Feeders, Distributors and Service mains - Radial and ring main systems - Calculation of voltage in distributors with concentrated and distributed loads, A.C. single phase and three phase distribution systems.

Text Books

Reference Books

10MS202 BUSINESS ENVIRONMENT

Credits: 2:0:0

Objectives
To understand the overall business environment and evaluate its various components in business decision making.
Learning Outcome:
The course helps the students to familiarise with the nature of business environment and its components. The course contents facilitate the students to develop conceptual framework of business environment and generate interest in international business.


Unit IV - Financial system – monetary and fiscal policies – credit market – money market and capital market- nature and constituents –industrial financing institutions (an overview).


Text Books

09MS209 MANAGERIAL SKILL

Credits: 2:0:0

Unit: I – (5 hrs)
Creativity - Basic concepts – Mental Abilities - Barriers to creativity – Convergent and Divergent thinking - Improving creativity – Creative Problem Solving methods – Steps to creative problem solving- Games on Creativity

Unit: II – (6 hrs)

Unit III – (7 hrs)
Team Building & Conflict Management - Groups and Teams – Teams basics – Stages of Team building – Forming, Storming, Norming, Performing, Adjourning – Characteristics of effective teams – Conflicts - Positive and Negative effects of conflict – Types and stages of conflict – Conflict Management styles - Role plays
Unit: IV – (7 hrs)

Group Discussion & Personal Interview

Unit IV – (5hrs)

Practical Sessions:
1. Resume writing, Group Discussion, & Interview.

Recommended Text Book

Reference Books:

09EE217 LINEAR AND DIGITAL IC LABORATORY

Credits: 0:0:2
1. Performance characteristics of Op-amp IC
2. Instrumentation amplifier using Op-amp ICs.
3. Maximally flat active filter using Op-amp IC.
4. Precision full wave and half wave rectifier, using Op-amp IC.
5. Wien’s bridge oscillator using Op-amp IC.
6. Astable multivibrator and Schmitt trigger, using Op-amp IC
7. Realization of different flip-flops, using logic gates.
8. Realization of simple switching functions, using NAND or NOR gates.
10. Shift register and Ring counter
11. Multiplexer and Demultiplexer
12. Digital to Analog converter
09EE215 AC MACHINES AND CONTROLS LABORATORY

Credits: 0:0:2
1. Load test on Three Phase Induction Motor
2. No load and blocked rotor tests on Three Phase Induction Motor
3. Speed control of Three Phase Induction Motor
4. Load test on Single Phase Induction Motor
5. Regulation of Alternator by EMF/ MMF methods
6. Operation of alternator on Infinite bus bar
7. V and Inverted V curve for Synchronous Motor
9. Transfer function of Separately Excited DC Generator.
10. Transfer function of a) Field controlled DC Motor b) Armature controlled DC Motor.
11. Time & Frequency Response of the System using MATLAB
12. Measurement of Physical Variable with the help of LABVIEW

EE252 ELECTRICAL MACHINE DESIGN

Credits 3:1:0

Pre requisite: DC Machines and Transformers
Induction and Synchronous Machines

Unit I: General Aspects
Major considerations – Limitations - Main dimension- Output equation - Choice of specific electric and magnetic loadings - Separation of D and L for rotating machines. MMF for air gap - Effects of slots, ventilating ducts and saliency - MMF for teeth -Total MMF calculation - Leakage reactance, Estimation of number of conductors / turns - Coils - Slots - Conductor dimension - Slot dimension.

Unit II: Dc Machines
Choice of number of poles - Length of Air gap - Design of field system, Inter poles, Commutator and Brushes.

Unit III: Transformers
Classification – output equation - Core section - Window dimensions - Yoke dimension - Overall dimension - No load current calculation – Temperature rise of Transformers- Design of tanks and cooling tubes.

Unit IV: Three Phase Induction Machines
Length of air gap - Cage rotor - End ring current - Wound rotor - Dispersion coefficient. No-load current calculation - Stator and rotor resistance - Losses and efficiency

Unit V: Synchronous Machines
Text Books

Reference Books:

EE254 POWER ELECTRONICS

Credits: 3:0:0

Unit I: Power Semiconductor Devices
Introduction - Power Diodes - Power Transistors - Power MOSFETs - IGBTs - Thyristor family: SCRs, Triacs, GTOs and IGCT - Static and Dynamic characteristics - Protection circuits - Series and parallel connections, MCT.

Unit II: Ac to Dc Converters

Unit III: Ac to Ac and Dc to Dc Converters

Unit IV: Dc to Ac Converters
Unit V: Control Circuits & Applications
Functional requirements of the switching control circuits - Generation of control signals for single phase AC to DC converters - Cosine wave crossing control, Ramp comparator approach. Generation of timing pulses for DC choppers - PWM techniques for DC to AC converters - Introduction to power converter control using Microprocessors, Microcontrollers and DSP. Applications: Motor drive applications: DC Motor Drives using Phase Controlled Thyristor Converters and DC Choppers - AC voltage controller and inverter fed induction motor drives - UPS - HVDC systems - Tap changing of Transformers.

Text Books

Reference Books

10MS201 ENGINEERING PROJECT COSTING
Credits: 2:1:0
Objective:
The basic objective of the course is to give an insight about the importance of costing and to create necessary cost awareness to the students which adds to their knowledge a focused approach /path in the present highly competitive globalised arena. This paper provides the necessary inputs particularly for students pursuing Engineering courses and imbibe knowledge on project cost analysis etc

Learning Outcome:
At the end of the course the students will able to know and apply the cost concepts in real life projects. Project costing knowledge gives the students a practical and foreseeing insight in his area of employment. It enables them to have an awareness on cost consciousness and helps them to take cost effective decisions.

UNIT-1 : INTRODUCTION: Costing –Scope, Objectives ,Advantages ,Limitations, Role of Costing in WTO Objections against costing, steps in installation of cost accounting system in business, Characteristics of an ideal costing system

UNIT-3: APPLICATIONS: Job costing-Objectives, merits, limitations, Application –Process costing- application, abnormal loss, abnormal gain- - Simple break even analysis- Inventory control in projects-

UNIT-4: PROJECT COST MANAGEMENT: Key project parties-Managing risk in private infrastructure project-Project related activities-PPP (Public private partnership in infrastructure projects-outline Facet of project analysis –Key issues in major investment decisions –statement of analysis of cost variation

UNIT-5: PROJECT INVESTMENT BUDGETING:- Objectives, common weakness-techniques(NPV, Payback, ARR, Profitability index)-Project disparities and conflict in ranking-Project control and Performance Analysis - Decision making.

Text Books:

Reference Book:

09EE219 MEASUREMENTS AND COMPUTER AIDED ELECTRICAL MACHINE DESIGN LAB

Credits: 0:0:2
1. Measurement of Resistance using Wheatstone and Kelvin’s bridge
2. Measurement of Inductance using Hays and Anderson bridge
3. Measurement of Capacitance using Schering and Maxwell bridge
4. Calibration of voltmeter, Ammeter and Wattmeter
5. Study of Resistive, Inductive and Capacitive Transducers.
6. Study of Thermo Electric Transducers
7. Design of D.C Machine using AutoCAD
8. Design of Single and Three Phase Transformer using AutoCAD
9. Design of Three phase Induction Motor using AutoCAD
10. Design of Single Phase Induction Motor using AutoCAD
11. Design of Synchronous Machine using AutoCAD
12. Effect of air gap variation on induction machines performance

09EE218 POWER ELECTRONICS LABORATORY

Credits: 0:0:2
13. Load test on Three Phase Induction Motor
14. No load and blocked rotor tests on Three Phase Induction Motor
EE256 POWER SYSTEM PROTECTION AND SWITCHGEARS

Credits: 3:0:0

Pre requisite: Power System Analysis

Unit I: Introduction
Principles and need for protective schemes – Nature and cause of faults – types of fault – per unit representation - Analysis of Symmetrical fault – Current limiting reactors. CTs and PTs and their applications in their protection schemes.

Unit II: Protective Relays & Apparatus & Line Protection
Definition - Requirement of relays - Universal torque equation - Non directional and directional over current relays – Earth fault relays - Distance relays - Impedance, Mho and Reactance relays - Differential relays - Negative sequence relays - Pilot (Translay) relay - Carrier and Microwave pilot relays – Under frequency relays - Introduction to static relays - Microprocessor and computer based protective relaying.
Unit III: Circuit Breakers
Functions of switchgear - Elementary principles of arc extinction - Arc control devices - Recovery voltage and restriking voltage - current chopping and capacitance current breaking - Bulk oil, low oil, air break, air blast, and sulphur hexafluoride and vacuum circuit breakers - HVDC breakers - Rating - Testing of circuit breakers.

Unit IV: Surge and Surge Protection
Switching surges - Lightning phenomenon – Traveling waves on transmission lines - Over voltage due to lightning - Protections against lightning - Lightning arresters – Types - Lightning arrester selection - Surge absorbers.

Unit V: Earthing and Insulation Co-Ordination
Solid, resistance and reactance Earthing - Arc suppression coil - Earthing transformers – Earth wires - Earthing of appliances- Insulation co-ordination: Definition - Determination of line insulation - Insulation levels of sub-station equipment - Co-ordination amongst items of substation equipment - Introduction to Indian Electricity rules.

Text Books

Reference Books
π-equivalent circuit of transformer with off-nominal tap ratio - Short Circuit Studies: Types of faults - Algorithms for fault calculations - Sequence Impedance matrices - Symmetrical and Unsymmetrical fault analysis using Zbus.

**Unit III: Load Flow Studies**

**Unit IV: Economical Operation of Generating Stations**
Optimal operation of generators – Economical scheduling of thermal plant with and without transmission losses – Loss formula derivation - Unit commitment - Elementary idea of optimal load scheduling of Hydro - Thermal plants.

**Unit V: Stability Studies**
Steady state and Transient stability - Swing equation and its solution by Modified Euler and Runge-Kutta methods - Equal area criterion - Factors affecting stability and methods of improving stability - Causes of voltage instability – voltage stability proximity indices for two-bus system

**Text Books**

**Reference Books**

**EE263 MICROPROCESSORS AND MICROCONTROLLERS**

**Credits: 3:1:0**

**Unit I: Architecture & Programming of 8085 Microprocessor:**
Unit II: Memory & I/O Interfacing

Unit III: Interrupts and Dma

Unit IV: Applications

Unit V: Intel 8051 Microcontroller

Text Books

Reference Books
2. The MCS – 80 / 85 Family User’s Manual, INTEL Corporation, USA.

10EE202 DIGITAL SIGNAL PROCESSING

Credits: 3:1:0
Course Objective:
This Course will provide the students
1. To have an overview of signals and systems.
2. To study DFT & FFT Transforms.
3. To study the design of IIR filters.
4. To study the design of FIR filters.
5. To study the applications of DSP techniques in processors.

**Unit I: Discrete Time Signals and Systems**

**Unit II: Discrete Transforms**

**Unit III: Infinite Impulse Response Digital Filters**

**Unit IV: Finite Impulse Response Digital Filters**

**Unit V: General Purpose Signal Processors**

**Text Books:**

**Reference Books:**
**Course Outcomes:**
At the end of the course the students will have an understanding on the
1. Different types of digital signals and systems.
2. Different Transforms and its application to signals and systems.
3. Design of IIR & FIR filters.
4. Different DSP processors.

**09EE220 COMPUTER AIDED POWER SYSTEMS ANALYSIS LABORATORY**

**Credits: 0:0:2**
1. Formation of $Y_{bus}$ Matrix using Direct Inspection Method
2. Formation of $Y_{bus}$ Matrix using Singular Transformation Method
3. Load Flow Analysis by Gauss-Seidel Method
4. Load Flow Analysis by Newton- Raphson Method
5. Automatic Load Frequency Control
6. Simulation of AVR(Automatic Voltage Regulator) using MATLAB-SIMULINK
7. $Z_{bus}$ Formation using building algorithm
8. Analysis of Symmetrical Faults
9. Perform Economic Load Dispatch using MATLAB programming
10. Transient Stability Analysis of single machine infinite bus bar (SMIB)
11. Harmonic Analysis of simple electrical circuit using MATLAB-SIMULINK
12. Speed Control of DC motor using MATLAB-SIMULINK

**EE277 MICROPROCESSORS AND MICROCONTROLLERS LABORATORY**

**Credit: 0:0:2**

12 Experiments will be notified by the HOD from time to time