II Year
I Semester

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

ELECTRICAL CIRCUIT ANALYSIS

Course Code: GR20A2023 **L/T/P/C:2/1/0/3**

II Year I Semester

Course Objectives:

1. Explain the various properties of Fourier series and Fourier transforms.
2. Simplify the transient state analysis of a circuit.
3. Evaluate the steady state analysis(three-phase) and dot convention of a given circuit.
4. Apply the Laplace Transforms to electrical circuits.
5. Develop the network parameters of the circuits.

Course Outcomes:

1. Apply Fourier Series, network theorems for the analysis of electrical circuits.
2. Develop the transient response of electrical circuits.
3. Analyze three-phase and mutually coupled circuits.
4. Solve electrical circuits using Laplace and Inverse Laplace transform and mark poles and zeros.
5. Simplify network by two port parameters.

UNIT I

FOURIER SERIES AND FOURIER TRANSFORM

Representation of continuous-time periodic signals by Fourier series; Dirichlet's conditions; Properties of Fourier series, Parseval's theorem; Trigonometric and Exponential Fourier series; Complex Fourier spectrum; Fourier transform via Fourier series; Fourier transform of periodic and aperiodic signals; Convergence of Fourier transform; Properties of Fourier transforms, Parseval's theorem; Fourier transforms involving impulse function and Signum function; Introduction to Hilbert Transform.

UNIT II

NETWORK THEOREMS

Maximum Power Transfer theorem, Reciprocity theorem, Millman theorem, Compensation theorem, Telligence Theorem, Concept of duality and dual networks.

Solution of First and Second order networks

Solution of first and second order differential equations for Series and parallel RL, RC, RLC circuits, initial and final conditions in network elements, forced and free response, time constants, steady state and transient state response.

UNIT III

THREE PHASE CIRCUITS AND COUPLED CIRCUITS

Three-phase circuits, star-star, delta-delta analysis of balanced circuits, unbalanced analysis of three phase 3 wire, 4 wire, delta circuits, measurement of power by three and two watt meters, measurement of reactive power by single wattmeter, Mutual coupled circuits, Dot Convention in coupled circuits.

UNIT IV

ELECTRICAL CIRCUIT ANALYSIS USING LAPLACE TRANSFORMS

Review of Laplace Transform, Analysis of electrical circuits using Laplace Transform for standard inputs, convolution integral, Inverse Laplace Transform, transformed network with initial conditions, Transfer function representation, Poles and Zeros.

UNIT V

TWO PORT NETWORKS

Two Port Networks, terminal pairs, relationship of two port variables, impedance, admittance,

hybrid and transmission parameters, condition for symmetry and reciprocity, interrelationship between various parameters, interconnections of two port networks (series, parallel and cascade)

Text Books

1. W. H. Hayt and J. E. Kemmerly, “Engineering Circuit Analysis”, McGraw Hill Education, 2013.
2. C. K. Alexander and M. N. O. Sadiku, “Fundamentals of Electric Circuits”, McGraw Hill Education, 2004.
3. M. E. Van Valkenburg, “Network Analysis”, Prentice Hall, 2006.

References

1. Circuit Theory (Analysis and Synthesis) by A.Chakrabarti-Dhanpat Rai & Co.
2. Network Theory by N.C.Jagan and C.Lakshminarayana, BS Publications.
3. K. V. V. Murthy and M. S. Kamath, “Basic Circuit Analysis”, Jaico Publishers, 1999.
4. D. Roy Choudhury, “Networks and Systems”, New Age International Publications, 1998.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
PRINCIPLES OF ANALOG ELECTRONICS

Course Code: GR20A2024 **L/T/P/C: 3/0/0/3**
II Year I Semester

Course Objectives:

1. To understand the diode principle, to analyze applications
2. To comprehend the principle and characteristics of BJT, MOSFETcircuits
3. To emphasis the working of OperationalAmplifiers
4. To study the linear & non-linear applications ofOp-Amps
5. To study the functioning of Op-Amp basedDigital to analog and Analog to digital converters

Course Outcomes:

1. Analyze the diode principle and analyse rectifier, clipping and clamping circuits.
2. Understand the characteristics of BJT, MOSFET transistors.
3. Explain the various Op-Amp circuits in different applications.
4. Define the principle and operation of Waveform generators and Multivibrator circuits.
5. Functioning of Op-Amp basedDigital to analog and Analog to digital converters.

UNIT I
DIODE CIRCUITS

P-N junction diode, biasing, V-I characteristics of a diode, diode equivalent circuits, static resistance, dynamic resistance, diffusion capacitance and transition capacitance. Breakdown mechanisms in diode, Zener breakdown, & Avalanche breakdown. Working of Half-wave and full-wave rectifiers, Clipping, types of clipping circuits, series. Clipper, Shunt Clipper, Clamping, types of clamping circuits

UNIT II
BJT AND MOSFET CIRCUITS

Structure, Principle and Operation of BJT, Common Emitter, Common Base and Common Collector Configurations, Input characteristics and Output Characteristics of a BJT; BJT as a switch, and amplifier, Operating point, DC & AC load lines, Transistor Hybrid parameter model, Common-emitter, common-base and common collector amplifiers, small-signal model, Small signal equivalent circuits, Biasing Circuits : Fixed Bias, Collector to Base bias, Self Biascircuits.MOSFET Structure, principle, enhancement mode and depletion mode devices, drain current - characteristics.

UNIT III
OPERATIONAL AMPLIFIERS

Introduction to Operational Amplifier, block diagram of operational amplifier, ideal characteristics of op-amp, practical op-amp, idealized analysis of op-amp circuits. Inverting , non-inverting amplifier and Voltage Follower Circuit.

Non-ideal characteristics in an op-amp Output offset voltage, input bias current, input offset current, thermal drift, slew rate, gain bandwidth product.

UNIT IV
LINEAR & NONLINEAR APPLICATIONS OF OP-AMP

Inverting summing amplifier, Non-Inverting Summing amplifier, differential amplifier, instrumentation amplifier, integrator, differentiator, Oscillators: Basic principle of an Oscillator, RC Phase shift and Wein bridge Oscillators, Schmitt Trigger Circuit, Zero Crossing Detector, Square-wave(AstableMuitivibrator) and triangular-wave generators. Precision rectifier, peak detector, Monostable Muitivibrator.

UNIT V

DIGITAL TO ANALOG AND ANALOG TO DIGITAL CONVERTERS

Digital to Analog converters: Weighted resistor D/A converter, R-2R Ladder D/A Converter, Specifications for D/A converters.Analog to digital converters: Sample and hold circuit, Quantization and encoding, Parallel comparator A/D converter, Successive approximation A/D converter, Counter Type A/D converter, Specifications of A/D converters.

Text/References Books:

1. S. Sedra and K. C. Smith, "Microelectronic Circuits", New York, Oxford University Press,1998.
2. D Roy Choudhury, Shail B Jain, "Linear Integrated Circuits", New Age International Pvt. Ltd., FourthEdition.
3. J. V. Wait, L. P. Huelsman and G. A. Korn, "Introduction to Operational Amplifier theory and applications", McGraw Hill U. S.,1992.
4. P. R. Gray, R. G. Meyer and S. Lewis, "Analysis and Design of Analog Integrated Circuits", John Wiley & Sons,2001.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
DC MACHINES AND TRANSFORMERS
Course Code: GR20A2025 L/T/P/C: 3/0/0/3
II Year I Semester

Course Objectives:

1. Knowledge on the concepts of magnetic circuits and principals of generators and motors.
2. Explain the operation of dc machines.
3. Analyse the differences in operation of different dc machine configurations.
4. Understanding the testing of different DC machines
5. Analyse single phase and three phase transformers circuits.

Course Outcomes:

1. Analyze linear and non-linear magnetic circuits
2.Summarize concepts of generators and motors
3.Select the appropriate DC generator or DC motor for the given application
4.Explain the different types of materials used in transformers.
5. Distinguish the performance of Transformers.

UNIT I
ELECTROMECHANICAL ENERGY CONVERSIONS
Review of magnetic circuits - MMF, flux, reluctance, inductance; B-H curve of magnetic materials; flux-linkage vs current characteristic of magnetic circuits; linear and nonlinear magnetic circuits; energy stored in the magnetic circuit; force as a partial derivative of stored energy with respect to position of a moving element; torque as a partial derivative of stored energy with respect to angular position of a rotating element. Examples galvanometer coil, relay contact, lifting magnet, rotating element with eccentricity or saliency

UNIT II
DC MACHINES
Basic construction of a DC machine, magnetic structure - stator yoke, stator poles, pole-faces or shoes, air gap and armature core, visualization of magnetic field produced by the field winding excitation with armature winding open, air gap flux density distribution, flux per pole, induced EMF in an armature coil. Armature winding and commutation – Elementary armature coil and commutator, lap and wave windings, construction of commutator, linear commutation Derivation of back EMF equation, armature MMF wave, derivation of torque equation, armature reaction, air gap flux density distribution with armature reaction.

UNIT III
DC MACHINE - MOTORING AND GENERATION
Armature circuit equation for motoring and generation, Types of field excitations – separately excited, self excited. Open circuit characteristic of separately excited DC generator, back EMF with armature reaction, voltage build-up in a shunt generator, critical field resistance and critical speed. Significance of back EMF, V-I characteristics and torque-speed characteristics of separately excited and self excited. Speed control methods, Losses, load testing and testing of DC machines. Brushless Dc Motor.

UNIT IV
TRANSFORMERS
Principle, construction and operation of single-phase transformers, equivalent circuit, phasor diagram, voltage regulation, losses and efficiency Testing - open circuit and short circuit tests, polarity test, back-to-back test, separation of hysteresis and eddy current losses. Autotransformers - construction, principle, applications and comparison with two winding

transformer, Magnetizing current, effect of nonlinear B-H curve of magnetic core material, harmonics in magnetization current.

UNIT V

3-PHASE TRANSFORMERS

Three-phase transformer - construction, types of connection and their comparative features, Parallel operation of single-phase and three-phase transformers, Phase conversion - Scott connection, three-phase to six-phase conversion, Tap-changing transformers - No-load and on-load tap-changing of transformers, Three-winding transformers. Cooling of transformers.

Text Books:

1. " Principles of Electric Machines and Power Electronics " P C SEN Second Edition.
2. P. S. Bimbhra, “Electrical Machinery”, Khanna Publishers, 2011.
3. I.J. Nagrath and D. P. Kothari, “Electric Machines”, McGraw Hill Education, 2010.

Reference Books:

1. A.E. Clayton and N. N. Hancock, “Performance and design of DC machines”, CBS Publishers, 2004.
2. M. G. Say, “Performance and design of AC machines”, CBS Publishers, 2002

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

ELECTROMAGNETIC FIELDS

Course Code: GR20A2026 **L/T/P/C: 3/0/0/3**

II Year I Semester

Course Objectives:

1. Apply vector Calculus and different coordinates systems for Electro and Magnetic systems.
2. Understand the knowledge of Electro field theory for Point, Line, Surface Charge.
3. Understand the concept of conductors, dielectrics, inductance, capacitance.
4. Ability to do Calculations of MFI for Line, Surface Conductors with different Shapes.
5. Ability of mathematical representation and analysis of EM waves at media interfaces.

Course Outcomes:

1. Solve the problems in different EM fields using Different Coordinates Systems.
2. Evaluate the Electric Field Density and Intensity for Different Charges.
3. Understand the Electromagnetic Relation using Maxwell Formulae.
4. Analyze circuits using Conductors in Time Varying Fields.
5. Analyze and solve problems of EM wave propagation at media interfaces.

UNIT I

STATIC ELECTRIC FIELD

Coulomb's law- Electric Field Intensity-Electrical Field due to Point charge, Line, Surface and Volume Charge distributions. Gauss Law and its Applications. Absolute Electric potential-Potential difference-Calculation of potential differences for different configurations. Electric Dipole- Electrostatic Energy density.

UNIT II

CONDUCTORS

Dielectrics and Capacitance Current and current density- Ohms Law in Point form- Continuity of current- Boundary conditions of perfect dielectric materials. Permittivity of dielectric materials- Capacitance-Capacitance of a two-wire line- Poisson's equation- Laplace's equation- Solution of Laplace and Poisson's equation- Application of Laplace's and Poisson's equations.

UNIT III

STATIC MAGNETIC FIELDS- Biot-Savart Law- Ampere Law-Magnetic flux and Magnetic Flux Density- Scalar and Vector Magnetic Potentials. Steady Magnetic Fields produced by current carrying conductors. Magnetic Forces-Materials and Inductance Force ona moving charge-Force on a differential current element- Force between differential current elements-Nature of magnetic materials- Magnetization and Permeability- magnetic boundaryconditions-Magnetic Circuits- inductances and mutual inductances.

UNIT IV

TIME VARYING FIELDS and Maxwell's Equations Faraday's law for Electromagnetic induction- Displacement current- Point form of Maxwell's equation- Integral form of Maxwell's equations- Motional Electromotive forces, Boundary Conditions.

UNIT V

WAVE EQUATIONS AND SOLUTIONS, Time-harmonic fields, Plane waves in lossless media, Plane waves in lossy media (low-less dielectrics and good conductors), Group Velocity, Electromagnetic power flow and poynting vector, Normal incidence at a plane conducting boundary, Normal incidence at a plane dielectric boundary.

Text/Reference Books:

1. Matthew N.O.Sadiku, "Principles of Electromagnetics", Oxford University Publication, 2014.
2. W.Hayt, John A.Buck "Engineering Electromagnetics", McGraw Hill Education, 2012.
3. Pramanik, "Electromagnetism-Problems with solution", Prentice Hall India, 2012.
4. G. W. Carter, "The electromagnetic field in its engineering aspects", Longmans, 1954.
5. Pramanik, "Electromagnetism - Theory and applications", PHI Learning Pvt. Ltd, New Delhi, 2009

GOKARAJURANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

POWER GENERATION AND TRANSMISSION

Course Code: GR20A2033 **L/T/P/C: 3/0/0/3**

II Year I Semester

Course Objectives: -

The objective of this course is to provide the student:

1. Basic Concepts of Power Generation resources
2. Knowledge about economics of power generation
3. With various power transmission lines models and their performance
4. Mechanical design of Power Transmission lines and concept of Corona
5. Study of overhead lines insulators and cables

Course Outcomes:

At the end of this course, students able to

1. Explainthe basic concepts of Power Generation.
2. Calculate economics of power generation.
3. Recall various power system components, line models and its performance.
4. Outline the different concepts related to mechanical design of transmission lines and corona
5. Demonstrate on overhead lines insulator and cables

UNIT-I: GENERATION OF ELECTRIC POWER

Conventional Sources (Qualitative): Hydro station, Steam Power Plant, Nuclear Power Plant and Gas Turbine Plant. Non-Conventional Sources (Qualitative): Ocean Energy, Tidal Energy, Wave Energy, wind Energy, Fuel Cells, and Solar Energy, Cogeneration and energy conservation and storage.

UNIT-II: ECONOMICS OF POWER GENERATION

Introduction, definitions of connected load, maximum demand, demand factor, load factor, diversity factor, Load duration curve, number and size of generator units. Base load and peak load plants. Cost of electrical energy-fixed cost, running cost, Tariff on charge to customer.

UNIT-III: TRANSMISSION LINE PARAMETERS AND PERFORMANCE

Line conductors, inductance and capacitance of single phase and three phase lines with symmetrical and unsymmetrical spacing, Composite conductors-transposition, bundled conductors, and effect of earth on capacitance. Representation of lines, short transmission lines, medium length lines, nominal T and PI- representations, long transmission lines. The equivalent circuit representation of a long Line, A, B, C, D constants, Ferranti Effect. Sending end and receiving end power circle diagrams.

UNIT-IV: MECHANICAL DESIGN OF OVERHEAD TRANSMISSION LINES AND CORONA

Tension and sag calculations, Factors affecting Sag, Sag template, Stringing charts, Vibrations and vibration damper.

Corona: Introduction, disruptive critical voltage, corona loss, Factors affecting corona loss and methods of reducing corona loss, Disadvantages of corona, interference between power and Communication lines.

UNIT-V: OVERHEAD LINE INSULATORS & INSULATED CABLES

Introduction, types of insulators, Potential distribution over a string of suspension insulators, Methods of equalizing the potential, testing of insulators. Introduction, insulation, insulating

materials,Under-Ground Cables: Types of Cables, grading of cables, insulation resistance of a cable, Capacitance of a single core and three core cables, Overhead lines versus underground cables, types of cables**.**

TEXTBOOKS

1. A Text Book on Power Systems Engineering by Sony, Gupta, Bhatnagar and Chakrabarti, Dhanapatrai& Co.
2. C.L. Wadhwa Generation, Distribution and Utilization of Electrical Energy, Second Edition, New AgeInternational,2009
3. C.L.Wadhwa " Electrical Power systems:New age Publishers 7th Edition 2017

References:

1. H.Cotton& H. Barber-The Transmission and Distribution of Electrical Energy, Third Edition, ELBS,B.I.Pub.,1985
2. Power generation technologies by Paul Breeze, Third Edition, Elsevier Publishers 2019

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
JAVA PROGRAMMING FOR ENGINEERS

Course Code: GR20A2028 **L/T/P/C: 2/0/0/2**
II Year I Semester

Course Objectives:

1. The Java programming language: its syntax, idioms, patterns, and styles.
2. Object oriented concepts in Java and apply for solving the problems.
3. How exception handling and multithreading makes Java robust
4. Explore java Standard API library such as io, util, applet, awt
5. Building of applications using Applets and Swings

Course Outcomes: Upon the successful completion of the course, the student will be able to:

1. Identify the model of Object-Oriented Programming: Abstract data types, Encapsulation, Inheritance and Polymorphism
2. Summarize the fundamental features like Interfaces, Exceptions and Collections
3. List the advantages of Multi-threading.
4. Design interactive programs using Applets, AWT and Swings
5. Develop real time applications using the features of Java

UNIT I

INTRODUCTION TO OOP: Introduction, Need of object-oriented programming, principles of object-oriented languages, Applications of OOP, history of JAVA, Java Virtual Machine, Java features, Program structures, Installation of JDK.

UNIT II

PROGRAMMING CONSTRUCTS: Variables, Primitive data types, Identifiers- Naming Conventions, Keywords, Literals, Operators- Binary, Unary and Ternary, Expressions, Primitive Type conversion and casting, flow of control- branching, conditional, loops.
Classes and Objects- Classes, Objects, Creating objects, methods, constructors- constructor overloading, cleaning up unused objects- Garbage collector, class variable and methods- static keyword, this keyword, arrays, Command line arguments.

UNIT III

INHERITANCE: Types of Inheritance, Deriving classes using extends keyword, method overloading, super keyword, final keyword, abstract class.
Interfaces: Interface, Extending interface, interface Vs Abstract classes.

UNIT IV

PACKAGES- Creating Packages, using Packages, Access protection, java I/O package. Exploring java.io and String classes.
Exceptions - Introduction, Exception handling techniques - try, catch, throw, throws, finally block, user defined Exception.

UNIT V

MULTITHREADING:java.lang. Thread, the main Thread, creation of new Threads, Thread priority, multiThreading- using isalive() and join(), Synchronization, suspending and resuming Threads, Communication between Threads.

Text/Reference Books:

1. Java: The Complete Reference, 10th edition, Herbert Schildt, McgrawHill.
2. Java Fundamentals: A Comprehensive Introduction, Herbert Schildt and Dale Skrien, TMH.
3. Java for Programming, P.J.DietelPearsonEducation
4. Object Oriented Programming through Java, P.Radha Krishna, UniversitiesPress.
5. Thinking in Java, Bruce Eckel, PearsonEducation
6. Programming in Java, S.Malhotra and S.Choudhary, Oxford University Press

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
PRINCIPLES OF ANALOG ELECTRONICS LAB
Course Code: GR20A2029 L/T/P/C: 0/0/3/1.5
II Year I Semester

Course Objectives: After completion of this course, Students must be able to

1. Classify the types of active components.
2. Describe the operations of Diode, BJT and MOSFET
3. Analyse different Configuration types of Operational Amplifier.
4. Implement the mathematical operation on signals.
5. Make conversant with Digital to Analog and Analog to Digital Converters

Course Outcomes: After completion of this course, Students will be able to

1. Recall types of active components.
2. Draw characteristics of Diode, BJT and MOSFET
3. Design Operational Amplifiers as inverting and non-inverting amplifier
4. Apply mathematical operation on signals using Operational Amplifier
5. Explain operation of Analog to Digital Conversion (ADC) and Digital to Analog Conversion (DAC)

LIST OF EXPERIMENTS:

1. Obtain characteristics of PN junction Diode i) Forward biased ii) Reverse Biased.
2. Design half wave rectifier circuit using diodes and draw Input and output graphs.
3. Design Clippers and Clampers using Diode
4. Obtain input and output characteristics of CE Configuration of BJT
5. Obtain input and output characteristics of CB Configuration of BJT
6. Obtain drain current characteristics for MOSFET
7. Design and implement Operational Amplifier as Inverting,
8. Design and implement Operational Amplifier as Non-Inverting Amplifier
9. Design and implement Subtractor
10. Design and implement Operational Amplifier as an Integrator
11. Design and implement Operational Amplifier as a Differentiator
12. Design and implement a precision rectifier using Operational Amplifier
13. Execute Analog to Digital Converters
14. Execute Digital to Analog Converters

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
DC MACHINES AND TRANSFORMERS LAB

Course Code: GR20A2030 **L/T/P/C: 0/0/3/1.5**

II Year I Semester

Course Objectives:

1. Strong background in different types of DC generators, Motors and Transformers, their construction, operation and applications
2. Understanding the various lab experiments connected with dc generators and there by achieve the design concepts.
3. Knowledge on application of dc motor concepts with respect to the performance characteristics of dc motors.
4. Knowledge on application of dc generator concepts with respect to the performance characteristics of dc generators.
5. Concept of back to back connection of a transformer and three phase to two phase conversion by Scott connection.

Course Outcomes:

1. Identify various parts of electrical DC machines and Transformers.
2. Develop knowledge helpful for application of DC machines and Transformers.
3. Explain and control of different DC Machines.
4. Distinguish the performance of different machines using different testing methods.
5. Determine the parameters of equivalent circuit of single phase transformer and performance.

LIST OF EXPERIMENTS

Task-1: Swinburne's test and Speed Control of a D.C Shunt Motor
Task-2: Brake Test on a DC Shunt Motor
Task-3: Brake Test on a DC Compound Motor
Task-4: Open Circuit Characteristics and Load test on a D.C. Shunt Generator
Task-5: Load test on a D.C. Series Generator
Task-6: Load test on D.C. Compound Generator
Task-7: Hopkinson Test
Task-8: Fields Test
Task-9: Separation of Core Losses of DC machine
Task-10: OC, SC and Load tests on single phase transformer.
Task-11: Sumpner's test.
Task-12: Scott connection.

In addition to the above experiments, at least any two of the following experiments are required to be conducted from the following list

Task-13: Heat run test on transformer.
Task-14: Separation of core losses of a single phase transformer
Task-15: Hysteresis loss determination. Parallel Operation of Transformers.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
CONSTITUTION OF INDIA

Course Code: GR20A2003 **L/T/P/C : 2/0/0/2**
II Year I Semester

Course objectives:

1. To create an awareness about the Constitution of India, Fundamental Rights and Duties, Directive Principles
2. To Learn the role of Prime Minister, President and the Council of Ministers and the State Legislature
3. To learn the divisions of executive, legislative and judiciary and so on.
4. To know how a municipal office, panchayat office etc. works
5. To understand the importance and role of Election Commission Functions.

Course Outcomes:

1. Students will be able to know the importance of Constitution and Government
2. Students will be able to become Good Citizens and know their fundamental rights, duties and principles.
3. Students will learn about the role of PM, President, Council of Ministers etc and it will help students learn about Local Administration.
4. The Students understand the importance of Election Commission and the Students will become aware of how a Country and State are run in Democracy.
5. They will know about Secularism, Federalism, Democracy, Liberty, Freedom of Expression, Special Status of States etc.,

UNIT I

INTRODUCTION: Constitution' meaning of the term, Indian Constitution: Sources and constitutional history, Features: Citizenship, Preamble, Fundamental Rights and Duties, Directive Principles of State Policy

UNIT II

UNION GOVERNMENT AND ITS ADMINISTRATION: Structure of the Indian Union: Federalism, Centre State relationship, President: Role, power and position, PM and Council of ministers, Cabinet and Central Secretariat, Lok Sabha, Rajya Sabha

UNIT III

STATE GOVERNMENT AND ITS ADMINISTRATION: Governor: Role and Position, CM and Council of ministers, State Secretariat: Organization, Structure and Functions

UNIT IV

LOCAL ADMINISTRATION: District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation, Pachayati raj: Introduction, PRI: ZillaPachayat, Elected officials and their roles, CEO ZillaPachayat: Position and role, Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials.

UNIT V

ELECTION COMMISSION

Election Commission: Role and Functioning, Chief Election Commissioner and Election Commissioners, State Election Commission: Role and Functioning, Institute and Bodies for the welfare of SC/ST/OBC.

REFERENCE BOOKS :

1. 'Indian Polity' by Laxmikanth 5th Edition, McGraw Hill Edition.
2. Indian Constitution by Subhash C. Kashyap, Vision Books Publisher
3. 'Introduction to Indian Constitution' by D.D. Basu, 21st Edition, LexisNexis Publisher
4. 'Indian Administration by Avasthiand Avasthi-by lakshminarainagarwalpublication

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

VALUE ETHICS AND GENDER CULTURE

Code: GR20A2002 **L/T/P/C :2/0/0/2**

II Year I Semester

Course Objectives:

1. To understand about the importance of ethical values
2. To understand the significance of human conduct and self-development
3. To enable students to imbibe and internalize the value and Ethical behaviour in personal and professional lives.
4. To provide a critical perspective on the socialization of men and women.
5. To create an awareness on gender violence and condemn it.

Course Outcomes

1. To enable the student to understand the core values that shapes the ethical behaviour. And Student will be able to realize the significance of ethical human conduct and self-development.
2. Students will be able to inculcate positive thinking, dignity of labour and religious tolerance.
3. The students will learn the rights and responsibilities as an employee and a team member.
4. Students will attain a finger grasp of how gender discrimination works in our society and how to counter it.
5. Students will develop a better understanding on issues related to gender and Empowering students to understand and respond to gender violence.

UNIT I

VALUES AND SELF-DEVELOPMENT

social values and individual attitudes, Importance of cultivation of values, Sense of duty, Devotion, Self-reliance, Confidence, Concentration, Truthfulness, Cleanliness, Honesty, Humanity, Power of faith, National unity, Patriotism, Love for nature, Discipline.

- ❖ A Case study on values and self-development

UNIT II

PERSONALITY AND BEHAVIOUR DEVELOPMENT

positive thinking, punctuality, avoiding fault finding, Free from anger, Dignity of labour, religious tolerance, Aware of self-destructive habits.

- ❖ A Case study on Personality

Unit III

INTRODUCTION TO PROFESSIONAL ETHICS

Basic Concepts, Governing Ethics, Personal & Professional Ethics, Ethical Dilemmas, Life Skills, Emotional Intelligence, Thoughts of Ethics, Value Education, Dimensions of Ethics, Profession and professionalism, Professional Associations, Professional Risks, Professional Accountabilities, Professional Success, Ethics and Profession.

- ❖ A Case study on professional ethics

Unit IV

INTRODUCTION TO GENDER

Definition of Gender, Basic Gender Concepts and Terminology, Attitudes towards Gender, Social Construction of Gender.

- ❖ A Case study/ video discussion on attitudes towards gender

UNIT V

GENDER-BASED VIOLENCE

The concept of violence, Types of Gender-based violence, the relationship between gender, development and violence, Gender-based violence from a human rights perspective.

❖ A Case study/ video discussion on gender-based violence in view of human rights

TEXTBOOKS

1. Professional Ethics: R. Subramanian, Oxford University Press, 2015.
2. Ethics in Engineering Practice & Research, Caroline Whit beck, 2e, Cambridge University Press 2015.
3. A Bilingual Textbook on Gender" written by A. Suneetha, Uma Bhrugubanda, DuggiralaVasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, GoguShyamala, Deepa Sreenivas and Susie Tharu and published by Telugu Akademi, Hyderabad,Telangana State in the year 2015.

REFERENCE BOOKS

1. Menon, Nivedita. Seeing like a Feminist. New Delhi: Zubaan-Penguin Books, 2012
2. Abdulali Sohaila. "I Fought For My Life…and Won."Available online at: http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulal/
3. Engineering Ethics, Concepts Cases: Charles E Harris Jr., Michael S Pritchard, Michael J Rabins, 4e , Cengage learning, 2015.
4. Business Ethics concepts & Cases: Manuel G Velasquez, 6e, PHI, 2008

II YEAR
II SEMESTER

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

PROBABILITY AND STATISTICS

Course Code: GR20A2005 **L/T/P/C: 3/0/0/3**

II Year II Semester

Course Objectives

1. Interpret the measures of central tendency and dispersion.
2. Distinguish between explanatory and response variables and analyze data using correlation and regression.
3. Apply various probability distributions.
4. Apply tests of hypothesis.
5. Employ basic analysis of time series data.

Course Outcomes

The expected outcomes of the Course are:

1. Compute and interpret descriptive statistics.
2. Evaluate random processes which occur in engineering applications governed by the Binomial, Poisson, Normal and Exponential distributions.
3. Fit the models using Regression Analysis.
4. Apply Inferential Statistics to make predictions or judgments about the population from which the sample data is drawn.
5. Interpret Time series data.

UNIT I

RANDOM VARIABLES, BASIC STATISTICS, CORRELATION AND REGRESSION

Notion of Randomness, Random Experiment, Random variables – Discrete and Continuous, Probability mass function and density function, constants of r.v.s (Mean, Variance, Monents about mean), Concept of Bivariate distributions and Covariance.

Measures of central tendency and moments.

Correlation : Karl-Pearson's correlation coefficient and Spearman's Rank correlation, Statements of their properties and problems, Simple and Multiple Linear Regression (three variables case only), Statements of properties of Regression coefficients and problems.

UNIT II

PROBABILITY DISTRIBUTIONS

Discrete Distributions: Binomial and Poisson distributions - definition, real life examples, Statements of their Mean and Variance, related problems, evaluation of statistical parameters.

Continuous Distributions: Normal, Exponential and Gamma distributions - definition, real life examples, Statements of their Mean and Variance and related problems, evaluation of statistical parameters for Normal distribution.

UNIT III

TESTING OF HYPOTHESIS-1 (LARGE SAMPLE)

Concept of Sampling distribution and Standard error, tests for single proportion, difference of proportions, single mean, difference of means and Chi-square test for independence of attributes. Estimation of confidence interval for population mean and population proportions.

UNIT IV

TESTING OF HYPOTHESIS-2 (SMALL SAMPLE)

Tests for single mean, difference of means, Population variance, ratio of variances, ANOVA 1-way and 2-way. Estimation of confidence interval for Population mean.

UNIT V

TIME SERIES ANALYSIS

Components of Time series, Additive and Multiplicative Decomposition of Time series components, Measuring trend by method of Moving averages, Straight line and Second degree parabola, Measuring seasonal variation by Ratio to Trend method and Ratio to Moving averages method.

Text / References:

1. S. C.Gupta&V.K.Kapoor, "Fundamentals of Mathematical Statistics", S.Chand.
2. Richard A.Johnson," Probability and Statistics for Engineers", Pearson Education.
3. Jay Devore, "Probability and Statistics for Engineering and the Sciences",Cengage learning.
4. Murat Kulahci,"Time series analysis and forecasting by example",John Wiley & Sons
5. S. C.Gupta&V.K.Kapoor, "Fundamentals of Applied Statistics", S.Chand.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

AC MACHINES

Course Code: GR20A2031 **L/T/P/C: 2/1/0/3**

II Year II Semester

Course Objectives:

1. Know the applications of single phase induction motor
2. Provide a foundation in the theory and application of Ac machines.
3. Train to have the solid foundation in technical concepts required to control the speed of 3-phase IM .
4. Provide with a strong back ground in 3-phase induction motor, speed control techniques and its Characteristics.
5. Provide Sufficient background in synchronous motor, testing of different types of rotors viz salient Pole & cylindrical pole machines

Course Outcomes: The Students are able to

1. Understand the concepts of rotating magnetic fields.
2. Importance of application of electrical Ac machines.
3. Demonstrate working of single and three phase AC machines.
4. Evaluate Machine Variables in direct and quadrature axis form for salient pole type,
5. Summarize the concept of harmonic created in supply system, need for reduction and design of synchronous machines for reducing them

UNIT 1

FUNDAMENTALS OF AC MACHINE WINDINGS

Physical arrangement of windings in stator and cylindrical rotor; slots for windings; single turn coil - active portion and overhang; full-pitch coils, concentrated winding, distributed winding, winding axis, 3D visualization of the above winding types, Air-gap MMF distribution with fixed current through winding - concentrated and distributed, sinusoidally distributed winding, winding distribution factor

UNIT II

PULSATING AND REVOLVING MAGNETIC FIELDS

Constant magnetic field, pulsating magnetic field - alternating current in windings with spatial displacement, Magnetic field produced by a single winding - fixed current and alternating current Pulsating fields produced by spatially displaced windings, Windings spatially shifted by 90 degrees, Addition of pulsating magnetic fields, Three windings spatially shifted by 120 degrees (carrying three-phase balanced currents), revolving magnetic field.

UNIT III

INDUCTION MACHINES

Construction, Types (squirrel cage and slip-ring), Torque Slip Characteristics, Starting and Maximum Torque. Equivalent circuit. Phasor Diagram, Losses and Efficiency. Effect of parameter variation on torque speed characteristics (variation of rotor and stator resistances, stator voltage, frequency). Methods of starting, braking and speed control for induction motors. Generator Operation. Self-Excitation. Doubly-Fed Induction Machines.

UNIT IV

SINGLE-PHASE INDUCTION MOTORS

Constructional features-double revolving field theory, equivalent circuit, determination of parameters. Split-phase starting methods and applications

UNIT V
SYNCHRONOUS MACHINES

Synchronous Generator: Basic principle of operation, construction of salient & non-salient pole synchronous machines, generated EMF, effect of distribution and chording of winding, harmonics-causes, reduction and elimination. Armature reaction, synchronous reactance, leakage reactance, phasor diagram of non-salient type alternator. Voltage regulation-EMF, MMF, ZPF and ASA Methods. Two reaction theory-direct and quadrature axis reactances, phasor diagram, slip test, synchronizing to infinite bus bars and parallel operation, steady state power-angle characteristics.

Synchronous Motor: Principle of operation, phasor diagrams, torque and torque angle, effect of change in load, effect of change in excitation, V and inverted V curves. Synchronous condensor, hunting and damping. Methods of starting synchronous motors.

Text/References Books:

1. A. E. Fitzgerald and C. Kingsley, "Electric Machinery", McGraw Hill Education, 2013.
2. M. G. Say, "Performance and design of AC machines", CBS Publishers, 2002.
3. P. S. Bimbhra, "Electrical Machinery", Khanna Publishers, 2011.
4. I. J. Nagrath and D. P. Kothari, "Electric Machines", McGraw Hill Education, 2010.
5. A. S. Langsdorf, "Alternating current machines", McGraw Hill Education, 1984.
6. P. C. Sen, "Principles of Electric Machines and Power Electronics", John Wiley & Sons, 2007.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

CONTROL SYSTEMS

Course Code: GR20A2032 **L/T/P/C: 3/0/0/3**

II Year II Semester

Course Objectives:

1. Outline of the fundamental concepts of Control Systems and block diagram algebra.
2. Analyze time response of second order systems.
3. Interpret the stability of a system by Root locus technique.
4. Develop Nyquist and Bode plots for the stability of a system.
5. Apply the concepts of Controllability and Observability.

Course Outcomes:

1. Summarize the basic elements and structures of feedback control systems.
2. Analyze the concept of time response, steady state response, errors.
3. Formulate Routh-Hurwitz table, rootlocus for the linear time-invariant systems.
4. Determine the stability of the system using Nyquist and Bode plots.
5. Develop control system models on state space models, to express state transition matrix and calculation of variables.

UNIT I
CONCEPTS OF CONTROL SYSTEMS AND TRANSFER FUNCTION REPRESENTATION

Open loop and closed loop control systems, different examples of control systems, classification of control systems, characteristics and effects of feedback, impulse response and transfer functions, translational and rotational mechanical systems, Transfer function of DC and AC Servomotor, Synchro transmitter and receiver, Block diagram reduction techniques, signal flow graphs, reduction using Mason's gain formula.

UNIT II
TIME RESPONSE ANALYSIS

Standard test signals, time response of first order systems, characteristic equation of feedback control systems, transient response of second order systems-time domain specifications, steady state response-steady state errors and error constants, effects of proportional derivative, proportional integral systems.

UNIT III
STABILITY ANALYSIS &ROOT LOCUS TECHNIQUE

Concept of stability, Routh stability criterion, Root locus concept, construction of root loci, effects of adding poles and zeros to G(s)H(s) on the root loci.

UNIT IV
STABILITY ANALYSIS IN FREQUENCY DOMAIN

Frequency domain specifications, Bode diagrams, Determination of frequency domain specifications and transfer function from the Bode diagram- Phase and Gain margin, stability analysis from Bode plots. Polar plots, Nyquist plots and applications of Nyquist criterion to find the stability.

UNIT V
STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS

Concepts of state, state variables and state vector, derivative of state model from transfer function, derivative of transfer function from state model, diagonalization, Eigenvalues and Stability Analysis, solving the time invariant state equations, state transition matrix and its properties, Controllability and Observability.

Text Books

1. Control Systems by A. Anand Kumar, 2nd edition, PHI Learning PrivateLimited
2. AutomaticControlSystems8theditionbyB.C.Kuo2003JohnWileyandSon‟s

References

1. Control Systems Engineering by I. J. Nagrath and M. Gopal, New Age International (P) Limited Publishers, 2ndedition
2. Control Systems Engineering by NISE 3rd Edition JohnWiley
3. Modern Control Engineering by Katsuhiko Ogata Prentice Hall of India Pvt Ltd, 3rd edition,1998.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
PRINCIPLES OF DIGITAL ELECTRONICS

Course Code: GR20A2027 **L/T/P/C: 3/0/0/3**

II Year II semester

Course Objectives:

1. Express the function of logic gates through diodes and transistors and their classifications.
2. Design of arithmetic and logic operations using Boolean postulates and K-Maps
3. Classify the types of Flip-Flops and steps involved in designing registers
4. Design of Synchronous, Asynchronous Counters including State diagram
5. Describe the classification of Memories and importance of PLD with example.

Course Outcomes:

1. Summarize the working of logic gates with applications, design of logic gates with diodes and transistors
2. Design the application using Combinational logic circuits by minimizing the function using K-Map
3. Analyze the types of Flip Flops and design procedure of synchronous and asynchronous sequential circuits
4. Design different types of counters and simplify state diagram for simplicity
5. Discuss the types of Memories and use of PLD's

UNIT I

NUMBER SYSTEMS AND LOGIC FAMILIES

Digital signals, logic gates NOR and Exclusive-OR operations, Boolean algebra, Boolean Postulates, number systems, one's and two's complements arithmetic, Binary codes: BCD, Weighted codes -2421,8421, gray code, error detecting and correcting codes, Hamming code.

UNIT II

MINIMIZATION TECHNIQUES: Standard and Canonical form representation for logic functions, minimization of logical functions using Boolean Postulates and Theorems, K-map representation, and simplification of logic functions using K-Map, don't care terms.

Combinational Logic Circuits: Multiplexer, De-Multiplexer/Decoders, Adders, Subtractors, carry look ahead adder, popular MSI chips, digital comparator, parity checker/generator, priority encoders.

UNIT III

SEQUENTIAL CIRCUITS: A 1-bit memory, the clocked SR flip flop, J- K, T and D types flipflops, Triggering of Flip Flops, Analysis of Clocked Sequential Circuits, Flip-Flop Excitation Tables, Conversion from one Flip-Flop to other.

Design Analysis And Registers: Analysis procedure, Circuits with Latches, Design Procedure. Registers with parallel load, Shift registers; Serial Transfer, Serial Addition, Universal Shift Register

UNIT IV

COUNTERS DESIGN: Ripple Counters; Binary Ripple Counter, BCD Ripple Counter, Synchronous Counters; Binary Counter, Up-Down Counter, BCD Counter, Binary Counter with Parallel Load, Counter with Unused States, Ring Counter, Johnson Counter,

Finite State Machine: State diagram, State Assignment, Capabilities and Limitations, Mealy and Moore models

UNIT V

SEMICONDUCTOR MEMORY: Memory organization and operation, expanding memory size, classification and characteristics of memories, sequential memory, read only memory (ROM), read and write memory (RAM).**ProgrammableLogicDevices**: ROM as a Programmable Logic Device, Programmable Array Logic and Programmable Logic Array.

TEXT/REFERENCES BOOKS:

1. R. P. Jain, "Modern Digital Electronics", McGraw Hill Education, 2009.
2. M. M. Mano, "Digital logic and Computer design", Pearson Education India, 2016.
3. A. Kumar, "Fundamentals of Digital Circuits", Prentice Hall India, 2016.
4. Charles H. Roth, Jr and Lizy Kurian John's, "Digital Systems Design Using VHDL", Cengage Learning

GOKARAJURANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
POWER DISTRIBUTION AND PROTECTION

Course Code: GR20A2034 **L/T/P/C:3/0/0/3**
II Year II Semester

Course Objectives: -
The objective of this course is to provide the student:

1. Concepts of Power Distribution Systems
2. With the classification of different types of Substations and layout models
3. Operating principles of Power Protective Relays
4. With different protection Schemes and circuit breakers
5. Knowledge about the generation of overvoltage and insulation coordination

Course Outcomes:
At the end of this course, students will be able to

1. Explainthe concepts of Power Distribution system.
2. Recall various substation layouts.
3. Outline the operation and identify the applications of Protective Relays.
4. Discuss about protection schemes and operation of circuit breakers.
5. Illustrate the generation of over-voltages and insulation coordination.

UNIT I
A.C. DISTRIBUTION&DC DISTRIBUTION
Classification of DC Distribution Systems. - Comparison of DC vs. AC and Under-Ground vs. Over- Head Distribution Systems. - Requirements and Design features of Distribution Systems. -Voltage Drop Calculations (Numerical Problems) in D.C Distributors for the following cases: Radial D.C Distributor fed one end and at the both the ends (equal/unequal Voltages) and Ring Main Distributor**.**
Introduction, AC distribution, Single phase, 3-phase, 3 phases 4 wire system, bus bar arrangement, Selection of site for substation. Voltage Drop Calculations (Numerical Problems) in A.C. Distributors for the following cases: Power Factors referred to receiving end voltage and with respect to respective load voltages**.**

UNIT II
SUBSTATIONS
Classification of Substations, Comparison between Outdoor and Indoor Sub-stations, Transformer Sub-stations, Pole mounted Sub-stations, Underground Sub-station, Symbols for equipment in Sub-stations, Equipment in a transformer sub-station, Bus-bar Arrangements in Sub-stations, Terminal and Through Sub-stations, Key diagram of 66/11 kV Sub-station, Key diagram of 11 kV/400 V indoor Sub-station

UNIT III
PROTECTIVE RELAYS
Fundamental requirements of Protective Relaying, Principle of Operation and Construction of Attracted armature, Balanced Beam, induction Disc and Induction Cup relays.
Relays Classification: Instantaneous, DMT and IDMT types.
Application of relays: Over current/ Under voltage relays, Direction relays, Differential Relays and Percentage Differential Relays. Universal torque equation, Distance relays: Impedance, Reactance and Mho and Off-Set Mho relays, Characteristics of Distance Relays and Comparison.

UNIT IV

CIRCUIT BREAKERS

Physics of arcing phenomenon and arc interruption – DC and AC circuit breaking – re-striking voltage and recovery voltage – rate of rise of recovery voltage – resistance switching – currentchopping – interruption of capacitivecurrent – Types of circuit breakers – air blast, air break, oil, SF6, MCBs, MCCBs and vacuum circuit breakers – comparison of different circuit breakers – Rating and selection of Circuit breakers.

UNIT V

OVERVOLTAGE PROTECTION AND INSULATION COORDINATION Over voltage due to arcing ground and Peterson coil, lightning, horn gaps, surge diverters, rod gaps, expulsion type lightning arrester, valve type lightning arrester, ground wires, ground rods, counter poise, surge absorbers, insulation coordination, volt-time curves.

TEXTBOOKS:

1. C.L.Wadhwa " Electrical Power systems:New age Publishers 7th Edition 2017
2. D. P. Kothari and I. J. Nagrath, "Modern Power System Analysis", McGraw Hill Education, 2003.
3. Badri Ram and Vishwakarma, D.N., 'Power System Protection and Switchgear', Tata McGraw Hill Publishing Company Ltd., 2nd Edition, 2011

REFERENCES:

1. B. M. Weedy, B. J. Cory, N. Jenkins, J. Ekanayake and G. Strbac, "Electric Power Systems", Wiley, 2012
2. Sunil S. Rao, 'Protective Switch Gear', Khanna Publishers, New Delhi, 13th Edition, 2008.

GOKARAJURANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
PRINCIPLES OF DIGITAL ELECTRONICS LAB

Course Code : GR20A2035 **L/T/P/C : 0/0/4/2**
II Year II Semester

Course Objectives:

1. Understand the types of logic gates and their families.
2. Design the arithmetic and logic operations using digital IC's.
3. Discuss, how the memory is created using sequential circuits.
4. Classify the types of Flip-Flops and their applications.
5. Discuss the importance of PLD with example.

Course Outcomes:

1. Understand working of logic families and logic gates.
2. Design and implement Combinational and Sequential logic circuits.
3. U3nderstand the process of Analog to Digital conversion and Digital to Analog conversion.
4. Analyze the types of Flip-Flops used in designing the registers.
5. Discuss the types of Memories and their advantages and application

LIST OF EXPERIMENTS

Task-1: Design and verification of basic logic gates.
Task-2: Simplify the given Boolean expression realize them using universal gates.
Task-3: Design and implementation of half/full adder
Task-4: Design and implementation of half subtractor/full subtractor
Task-5: Design and implementation of parallel adder
Task-6: Design and implementation of subtractor
Task-7: Design and implementation of multiplexer
Task-8: Design and implementation of Decoder
Task-9: Design and implementation of one bit magnitude comparator.
Task-10: Design and implementation of two bit magnitude comparators
Task-11: Implementation and verification of truth table for R-S, J-K, D and T flip-flops.
Task-12: Implementation and verification of truth table for J-K flip-flop, Master-slave.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
AC MACHINES LAB

Course Code: GR20A2036 **L/T/P/C: 0/0/4/2**
II Year II Semester

Course Objectives:

1. Demonstrate various parts of three phase induction motors.
2. Demonstrate various parts of single phase induction motors.
3. Demonstrate various parts of alternators.
4. Test for induction generator.
5. Design any electrical machine.

Course Outcomes:

1. Explain the concepts of rotating magnetic fields.
2. Solve the parameters of equivalent circuit of single phase induction motor.
3. Analyze performance characteristics of AC machines
4. Apply various characteristics of three phase induction motor.
5. Experiment with synchronous machine to find direct and quadrature axis reactance.

LIST OF EXPERIMENTS:

Task-1: Brake Test on Slip Ring Induction Motor.

Task-2: No load and Blocked Rotor Tests on Squirrel Cage Induction Motor.

Task-3: Equivalent Circuit of a Single Phase Induction Motor.

Task-4: Regulation of Alternator by Synchronous Impedance Method and MMF Method.

Task-5: Determination of X_d and X_q of a Salient Pole Synchronous Machine from Slip Test.

Task-6: V and inverted V curves of a 3-Phase Synchronous Motor.

Task-7: Induction Generator.

Task-8: Determination of sub-transient reactances of Salient Pole Synchronous Machine.

Task-9: Determination of sequence impedances of Salient Pole Synchronous Machine.

Task-10: Rotor-resistance starter for Slip Ring Induction Motor.

Task-11: Star-delta starter for Squirrel Cage Induction Motor.

Task-12: Parallel operation of Alternators.

Task-13: Regulation of Alternator by ZPF Method.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
CONTROL SYSTEMS LAB

Course Code: GR20A2037 **L/T/P/C: 0/0/4/2**
II Year II Semester

Course Objectives:

1. Develop hands-on experience in analysing, designing and carrying out experiments in control systems.
2. Familiarize the stability analysis techniques and their applications in control systems.
3. Analyze and simulate different transfer functions with variety of inputs.
4. Describe the principle of PID controller.
5. Conduct experiments with dc servomotor and synchros.

Course Outcomes:

1. Make use of simulation packages for simple control system programs.
2. Illustrate the characteristics of synchros.
3. Analyze the root locus and bode plots.
4. Determine the transfer function of DC motor/generator.
5. Design the lead and lag compensators and Discuss the performance of servomotor and PID controller.

LIST OF EXPERIMENTS:

Task-1: Transfer function from zeros and poles and vice versa.

Task-2: Step response, Ramp response and Impulse response of a given transfer function.

Task-3: Root Locus from a Transfer function.

Task-4: Bode Plot and Nyquist Plot from a Transfer function.

Task-5: State Model from a Transfer function.

Task-6: Zeros and poles from state model.

Task-7: Transfer function of DC motor/Generator.

Task-8: Transfer function of Magnetic Levitation system

Task-9: Time Response of second order system.

Task-10: DC Servomotor.

Task-11: PID Controller.

Task-12: Characteristics of Synchros.

Task-13: Lag& Lead Compensator.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
ENVIRONMENTAL SCIENCE

Course Code: GR20A2001 **L/T/P/C:2/0/0/2**
II Year II Semester

Course Objectives:

1. Understanding the importance of ecological balance for sustainable development.
2. Understanding the impacts of developmental activities and mitigation measures.
3. Understanding the environmental policies and regulations
4. Integrate human ecology and science of environmental problems.
5. The effect of human activities on atmospheric pollution

Course Outcomes:

Based on this course, the Engineering graduate will

1. Understand the harmonious co-existence in between nature and human being
2. Recognize various problems related to environment degradation.
3. Develop relevant research questions for environmental investigation.
4. Generate ideas and solutions to solve environmental problems due to soil, air and water pollution.
5. Evaluate and develop technologies based on ecological principles and environmental regulations which in turn helps in sustainable development.

UNIT I

Ecosystems: Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Bio magnification, ecosystem resources and resilience, ecosystem value, services and carrying capacity.

UNIT II

Natural Resources: Classification of Resources: Living and Non-Living resources, natural capital & Resources water resources: use and over utilization of surface and ground water, conflicts over water, floods and droughts, Dams: benefits and problems. Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, Land resources: Forest resources, Energy resources: growing energy needs, renewable and non-renewable energy sources, use of alternate energy source, case studies.

UNIT III

Biodiversity and Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversity act.

UNIT IV

Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, Air Pollution: Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. Water pollution: Sources and types of pollution, drinking water quality standards. Soil Pollution: Sources and types, Impacts of modern agriculture, degradation of soil. Noise Pollution: Sources and Health hazards, standards, Solid waste: Municipal Solid Waste management, composition and characteristics of e-Waste and its management. Pollution control technologies: Waste water Treatment methods: Primary, secondary and Tertiary.

Global Environmental Issues and Global Efforts: Climate change and impacts on human

environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol, and Montréal Protocol. Anthropogenic activities, influence on the occurrence of COVID-19 Pandemic? How environment benefitted due to global lockdown arising out of corona outbreak.

UNIT V

Environmental Policy, Legislation & EIA: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Life cycle analysis (LCA), Towards Sustainable Future: Concept of Sustainable Development Goals, Population and its explosion, Resource exploitation, Crazy Consumerism, Environmental Education, Environmental Ethics, Concept of Green Building.

TEXT BOOKS:

1. Environmental Studies by Anubha Kaushik, 4th Edition, New Age International Publishers.
2. Textbook of Environmental Studies for Undergraduate Courses by ErachBharucha for University Grants Commission.

REFERENCE BOOKS:

1. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.
2. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
3. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela.2008 PHI Learning Pvt. Ltd.
4. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
5. Introduction to Environmental Science by Y. Anjaneyulu, BS Publications.
6. Environmental Studies by R. Rajagopalan, Oxford University Press.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
DATA BASE FOR ENGINEERS

Course Code: GR20A2006 **L/T/P/C: 2/0/0/2**
II Year II Semester

Course Objectives:

1. To understand the different issues involved in the design and implementation of a database system.
2. To understand Structured Query Language for manipulating the Data.
3. To study the physical, conceptual and logical database designs
4. To provide concepts of Transaction, Concurrency and Recovery Management Strategies of a DBMS
5. To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modelling, designing, and implementing a DBMS.

Course Outcomes:

1. Identify the role of Database System Applications and the design issues related.
2. Design the logical model for the applications and apply indexing techniques.
3. Construct a Database Schema, Manipulate data using a SQL.
4. Can apply the Schema Refinement techniques for a database design for optimizedaccess.
5. For a given transaction-processing system, determine the transaction atomicity,consistency, isolation, and durability.

UNIT –I

Introduction to DBMS, Data Base System Applications, Data Base System VS File System, Instances And Schemas, Data Models – The ER Model, ER Diagrams –Attributes And Entity Sets – Relationships And Relationship Sets – Concept Design With The ER Model .

To Practice:

1) Practicing DDL commands: Creating tables for various relations (in SQL).

2) Practicing Hostel Management System ER Diagram, Airlines Reservation System ER Diagram.

UNIT –II

Relational Model: Introduction To The Relational Model – Basic Structure, Database Schema, Keys, Form Of Basic SQL Query – Database Langugages , DDL , DML , Examples Of Basic SQL Queries .

To Practice:

Practicing SQL Queries of above mentioned topics

UNIT –III

SQLoperators,SQL functions, JOINS, -Types of Joins,Introduction To Nested Queries, Set Operators,Integrity Constraints over relations,Introduction to Views , Destroying / altering tables and views.Practice on DCL and TCL commands.

To Practice:

Practicing SQL Queries of above mentioned topics

UNIT –IV

Pitfalls in relational databases,Functional Dependencies ,Importance of Normalization–

1NF,2NF,3NF,BCNF,4NF
To Practice:
Concepts of Normalizations and its types, Writing Assertions.

UNIT –V

Transaction Concept- Transaction state,ACID properties, Concurrent executions,Serializability, Lock based protocols,Log based recovery.
To Practice:
Practicing,DCL and TCL commands, (Commit, rollback, Save points, Grant, Revoke and Roles commands on tables)

TEXT BOOK:

1.“Data base Management Systems”, Raghurama Krishnan, Johannes Gehrke, TATAMcGraw Hill 3rd Edition

REFERENCE BOOKS:

1.“Data base System Concepts”, Silberschatz, Korth, McGraw hill, V edition.
2. “Introduction to Database Systems”, C.J.Date Pearson Education.
3. “Database Systems design, Implementation, and Management”, Rob & Coronel 5th Edition.
4. “Database Management Systems”, P. Radha Krishna HI-TECH Publications 2005.
5. “Database Management System”, ElmasriNavate Pearson Education.
6. “Database Management System”, Mathew Leon, Leo.