KKR & KSR
INSTITUTE OF TECHNOLOGY AND SCIENCES (AUTONOMOUS)

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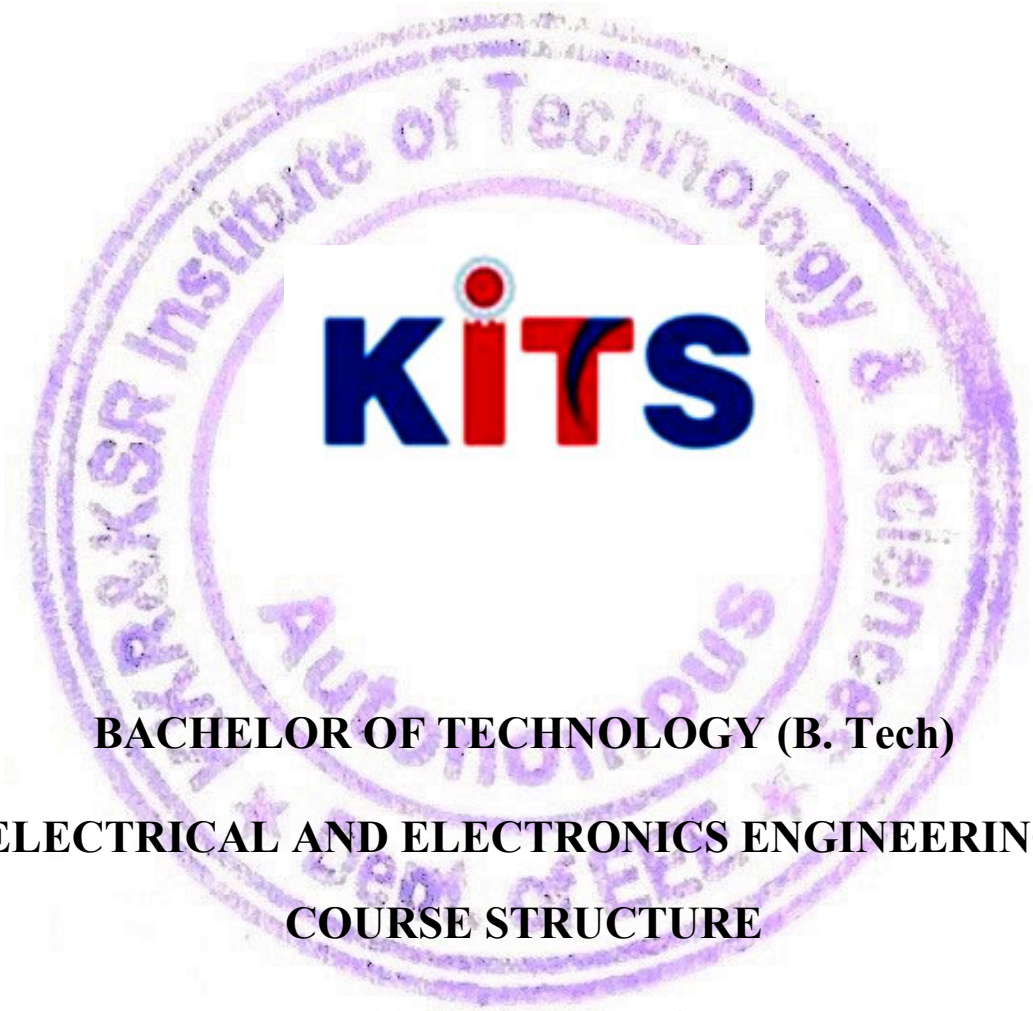
Vinjanampadu, Vatticherukuru Mandal, Guntur, Andhra Pradesh 522017



BACHELOR OF TECHNOLOGY (B. Tech)

ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE

R-20 REGULATION
(CHOICE BASED CREDIT SYSTEM)

(Applicable from the batches admitted in AY: 2020-2021
& Lateral Entry AY: 2021-2022)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

SEMESTER-I

S. No.	Course Code	Course Title	L	T	P	C	IM	EM	TM
THEORY									
1	20SH1T01	Communicative English	3	0	0	3	30	70	100
2	20SH1T02	Applied Physics	3	0	0	3	30	70	100
3	20SH1T07	Linear Algebra and Vector Calculus	3	0	0	3	30	70	100
4	20EE1T01	Electrical Installation and Electronics Engineering Practice	2	0	2	3	30	70	100
5	20CS1T01	Problem Solving and Programming Using C	3	0	0	3	30	70	100
6	20GE1M01	Environmental Science	2	0	0	---	---	---	---
PRACTICAL									
7	20SH1L01	English Communicative Skills Lab	0	0	3	1.5	15	35	50
8	20SH1L02	Applied Physics Lab	0	0	3	1.5	15	35	50
9	20CS1L01	Problem Solving and Programming Using C Lab	0	0	3	1.5	15	35	50
					Total Credits	**19.5**	**195**	**455**	**650**

Theory: BSC-2, HSMC-1, ESC-2 Practical: BSC-1, HSMC-1, ESC-1

SEMESTER-II

S. No.	Course Code	Course Title	L	T	P	C	IM	EM	TM
THEORY									
1	20SH2T04	Applied Chemistry	3	0	0	3	30	70	100
2	20SH2T06	Differential Equations	3	0	0	3	30	70	100
3	20ME2T01	Engineering Graphics	1	0	4	3	30	70	100
4	20ME2T02	Basic of Mechanical Engineering	3	0	0	3	30	70	100
5	20EE2T01	Network Analysis	3	0	0	3	30	70	100
PRACTICAL									
6	20SH2L04	Applied Chemistry Lab	0	0	3	1.5	15	35	50
7	20ME2L01	Mechanical Engineering Lab	0	0	3	1.5	15	35	50
8	20CS2L02	IT Workshop	0	0	3	1.5	15	35	50
					Total Credits	**19.5**	**195**	**455**	**650**

Theory: BSC-2, ESC-3 Practical: BSC-1, ESC-2

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

SEMESTER-III

S. No.	Course Code	Course Title	L	T	P	C	IM	EM	TM
THEORY									
1	**20SH3T03**	Numerical Methods and Transformations	3	0	0	3	30	70	100
2	20EE3T01	Electrical Circuits and Synthesis	2	1	0	3	30	70	100
3	20EE3T02	Electrical Machines-I	3	0	0	3	30	70	100
4	20EE3T03	Electromagnetic Fields	3	0	0	3	30	70	100
5	**20EC3T04**	Analog Electronics	3	0	0	3	30	70	100
6	20GE3M01	Constitution of Indian	2	0	0	---	---	---	---
PRACTICAL									
7	20EE3L01	Electrical Circuits and Simulation Lab	0	0	3	1.5	15	35	50
8	20EE3L02	Electrical Machines Lab-I	0	0	3	1.5	15	35	50
9	**20EC3L04**	Analog Electronics Lab	0	0	3	1.5	15	35	50
10	20EE3S01	MATLAB/Simulink (Basic level Skill Oriented courses-I)	1	0	2	2.0	---	50	50
					Total Credits	**21.5**	**195**	**505**	**700**

Theory: BSC-1, PCC-4 Practical: PCC-3, SC-1, MC-1

SEMESTER-IV

S. No.	Course Code	Course Title	L	T	P	C	IM	EM	TM
THEORY									
1	20EE4T01	Electrical Machines-II	3	0	0	3	30	70	100
2	20EE4T02	Control Systems	2	1	0	3	30	70	100
3	**20EC4T04**	Digital Electronics	3	0	0	3	30	70	100
4	**20CS4T03**	Data Structures & Algorithms	3	0	0	3	30	70	100
5	**20SH4T06**	**Principles of Economics and Management**	3	0	0	3	30	70	100
PRACTICAL									
6	20EE4L01	Electrical Machines Lab-II	0	0	3	1.5	15	35	50
7	**20EC4L03**	Digital Electronics Lab	0	0	3	1.5	15	35	50
8	**20CS4L03**	Data Structures & Algorithms Lab	0	0	3	1.5	15	35	50
9	20EE4S01	PLC Programming for Automation (Basic level skill Oriented courses-II)	1	0	2	2.0	---	50	50
					Total Credits	**21.5**	**195**	**505**	**700**

Theory: ESC-1, PCC-3, HSMC-1 Practical: ESC-1, PCC-2, SC-1

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: I

Course Code	Course Name	L	T	P	C
20SH1T01	Communicative English	3	0	0	3

INTRODUCTION:

The course is designed to train students in receptive (listening and reading) as well as productive and interactive (speaking and writing) skills by incorporating a comprehensive, coherent and integrated approach that improves the learners' ability to effectively use English language in academic/ workplace contexts. The shift is from learning about the language to using the language. On successful completion of the compulsory English language course/s in B.Tech., learners would be confident of appearing for international language qualification/proficiency tests such as IELTS, TOEFL, or BEC, besides being able to express themselves clearly in speech and competently handle the writing tasks and verbal ability component of campus placement tests. Activity based teaching-learning methods would be adopted to ensure that learners would engage in actual use of language both in the classroom and laboratory sessions.

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : recall life in one's past which had fine balancing act

CO2 : decide the qualities required to take up a promising career.

CO3 : evaluate the obstacles hinder of student's progress and find the ways to overcome them

CO4 : explain the environment activism and empowerment of women.

CO5 : interpret the efforts of successful persons to keep idealistic approach in achieving goals.

SYLLABUS:

UNIT-I : A Drawer full of happiness

Speaking: Asking and answering general questions on familiar topics such as home, family, work, Study and interests. Self-introduction and introduce others.

Vocabulary: Technical vocabulary from a cross technical branches, GRE Vocabulary (Antonyms and Synonyms, Word applications).

Grammar: Content words and function words; word forms: verbs, nouns, adjectives and adverbs; nouns- Countable and uncountable; singular and plural, basic sentence structures; simple question form–'wh' questions; word order in sentences.

Writing: Note Making and Note Taking.

UNIT-II : Nehru's letter to daughter Indira on her Birthday

Speaking: Discussion in pairs, small groups on specific topics followed by short structured talks. Functional English: Greetings and leave takings.

Vocabulary: Technical vocabulary from across technical branches. GRE Vocabulary, Analogies (Antonyms and Synonyms, Word applications)

Grammar: Use of articles and zero article; prepositions.

Writing: Resume, Cover Letter.

Employability Skills: Time Management

UNIT-III : Stephen Hawking-Positivity 'Benchmark'

Speaking: Discussing specific topics in pairs or in small groups and reporting what is discussed. Functional English: Complaining and Apologizing.

Reading: Reading a text in detail by making basic inferences-recognizing and interpreting Specific context clues; strategies to use text clues for comprehension. Critical reading.

Vocabulary: Technical vocabulary from a cross technical branches, GRE Vocabulary (Antonyms and Synonyms, Word applications) Association, sequencing of words- Grammar: Verbs–Tenses; subject-verb agreement.

Writing: Letter Writing: -Formal, Business, Editorial, Complaints, Applications, Permissions.

Employability Skills: Leadership skills

UNIT-IV : Like a Tree, Unbowed: Wangari Maathai-biography

Reading: Studying the use of graphic elements in texts to convey information, reveal trends / patterns / relationships, communicative process or display complicated data.

Reading for Writing: Information transfer; describe, compare, contrast, identify significance/trends based on information provided in figures/charts/graphs/tables.

Vocabulary: Technical vocabulary from across technical branches, GRE Vocabulary, (Antonyms and Synonyms, Word applications) Cloze Encounters.

Writing: Essay Writings: - Paragraph Writing, Precis Writing,

Employability Skills: Management skills.

UNIT-V : Stay Hungry-Stay Foolish

Reading: RAP Strategy Intensive reading and Extensive reading techniques.

Reading for Writing: Writing academic proposals- writing research articles: format and style. Vocabulary: Technical vocabulary from across technical branches, GRE Vocabulary (Antonyms and Synonyms, Word applications) Coherence, matching emotions.

Grammar: Editing short texts–identifying and correcting common errors in grammar and usage

(Articles, prepositions, tenses, subject verb agreement)

Writing: E- Mail, Reports, Reporting to media.

Employability Skills: Creative Thinking

TEXTBOOKS:

1. "Infotech English", Maruthi Publications.

REFERENCEBOOKS:

1. Bailey, Stephen. Academic writing: A hand book for international students. Routledge, 2014.
2. Chase, Becky Tarver. Pathways: Listening, Speaking and Critical Thinking. Heinley ELT; 2nd Edition, 2018.
3. SkillfulLevel2 Reading & Writing Student's Book Pack (B1) Macmillan Educational.
4. Hewings, Martin.Cambridge Academic English (B2). CUP,2012.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: I

Course Code	Course Name	L	T	P	C
20SH1T02	Applied Physics	3	0	0	3

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : explain the need of coherent sources and the conditions for sustained interference.

CO2 : understand the basic concepts of laser light sources

CO3 : analyze the physical significance of wave function.

CO4 : identify the type of semiconductor using hall effect.

CO5 : apply the concept of magnetism to magnetic devices

SYLLABUS:

UNIT-I : Wave Optics

Interference: Principle of superposition –Interference of light - Interference in thin films (Reflection Geometry) & applications -Colors in thin films- Newton's Rings- Determination of wavelength and refractive index.

Diffraction: Introduction - Fresnel and Fraunhofer diffraction - Fraunhofer diffraction due to single slit, double slit - N-slits (Qualitative) – Grating - Dispersive power and resolving power of Grating (Qualitative).

Polarization: Introduction-Types of polarization - Polarization by reflection, refraction and Double refraction - Nicol's Prism -Half wave and Quarter wave plates.

UNIT-II : Lasers & Fiber Optics

Lasers: Introduction – Characteristics of laser – Spontaneous and Stimulated emissions of radiation-Einstein's coefficients – Population inversion –Lasing action- Pumping mechanisms –Ruby laser – He-Ne laser - Applications of lasers.

Fiber Optics: Introduction –Principle of optical fiber- Acceptance Angle-Numerical Aperture-Classification of optical fibers based on refractive index profile and modes –Propagation of electromagnetic wave through optical fibers - Applications.

UNIT-III : Magnetism & Dielectrics

Magnetism: Introduction - Magnetic dipole moment - Magnetization-Magnetic susceptibility and permeability- Origin of permanent magnetic moment - Bohr magneton- Classification of magnetic materials: Dia, para & Ferro – Domain concept of Ferromagnetism – Hysteresis – soft and hard

magnetic materials – applications of Ferromagnetic material.

Dielectrics: Introduction - Dielectric Polarization-Dielectric polarizability, Susceptibility and Dielectric constant- Types of polarizations: Electronic and Ionic (Quantitative), Orientation. Polarizations (Qualitative) - Lorentz Internal field-Claussius –Mossotti's equation- Frequency dependence of polarization - Applications of dielectrics.

UNIT-IV : Quantum Mechanics, Free Electron Theory & Band Theory of Solids

Introduction – matter waves – de Broglie's hypothesis, Heisenberg's Uncertainty Principle Schrödinger time independent and time dependent wave equations – physical significance of Schrödinger wave function – Particle in a potential box (determination of energy).

Free Electron Theory: Introduction - Classical free electron theory (Qualitative with discussion of merits and demerits) – Quantum free electron theory- Equation for electrical conductivity based on quantum free electron theory-Fermi-Dirac distribution- Density of states (3D) – Fermi energy.

Band Theory of Solids: Introduction - Bloch theorem, krong-Penney model, E vs K diagram, effective mass of electron, classification of c solids –concept of hole

UNIT-V : SEMICONDUCTOR PHYSICS

Introduction – Intrinsic semiconductors - density of charge carriers – Electrical conductivity - Fermi level - extrinsic semiconductors - P-type & N-type - Density of charge carriers - Dependence of Fermi energy on carrier concentration and temperature- Drift and Diffusion currents - Einstein's equation. Hall effect- Hall coefficient - Applications of Hall effect.

TEXT BOOKS:

1. B. K. Pandey, S. Chaturvedi., "Engineering Physics" - Cengage Publications, 2012
2. M.N. Avadhanulu, P.G.Kshirsagar., "A Text book of Engineering Physics" - S.Chand, 2017.
3. D.K.Bhattacharya and Poonam Tandon., "Engineering Physics", Oxford press (2015).
4. R.K Gaur. and S.L Gupta., "Engineering Physics" - Dhanpat Rai publishers, 2012.

REFERENCE BOOKS:

1. M.R.Srinivasan, "Engineering Physics", New Age international publishers (2009).
2. Ajoy Ghatak "Optics", 6th Edition McGraw Hill Education, 2017.
3. A.J.Dekker "Solid State Physics", Mc Millan Publishers (2011).

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: I

Course Code	Course Name	L	T	P	C
20SH1T07	Linear Algebra and Vector Calculus	3	0	0	3

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : solve simultaneous linear equations numerically using various matrix methods

CO2 : find the eigen values and eigen vectors of a given matrix and nature of quadratic form

CO3 : determine double integral over a region and triple integral over a volume

CO4 : calculate gradient of a scalar function, divergence and curl of a vector function

CO5 : determine line, surface and volume integrals and apply green, stokes and gauss divergence theorems to calculate line, surface and volume integrals

SYLLABUS:

UNIT-I : Linear systems of equations

Rank - Echelon form – Normal form – Solving system of homogeneous and Non– Homogeneous equations – Gauss elimination – Gauss Jordon. Applications: Finding the current in electrical circuits.

UNIT-II : Eigen values - Eigen vectors and Quadratic forms

Eigen values – Eigen vectors– Properties (without proof) – Clayey-Hamilton theorem (Without of proof) – Inverse and powers of a matrix by using Clayey-Hamilton theorem– Diagonalisation – Reduction of quadratic form to canonical form by Orthogonalisation – Rank – Positive, negative and semi definite – Index – Signature

UNIT-III : Multiple integrals

Double and Triple integrals – Change of order of integration – Change of variables. Applications: Finding Areas.

UNIT-IV : Vector Differentiation

Gradient– Directional derivative – Divergence – Curl – Scalar Potential – Laplacian and second order operators -Vector identities

UNIT-V : Vector Integration

Line integral – Work done – Potential function – Surface and volume integrals – Vector integral theorems: Greens, Stokes and Gauss Divergence theorems (without proof).

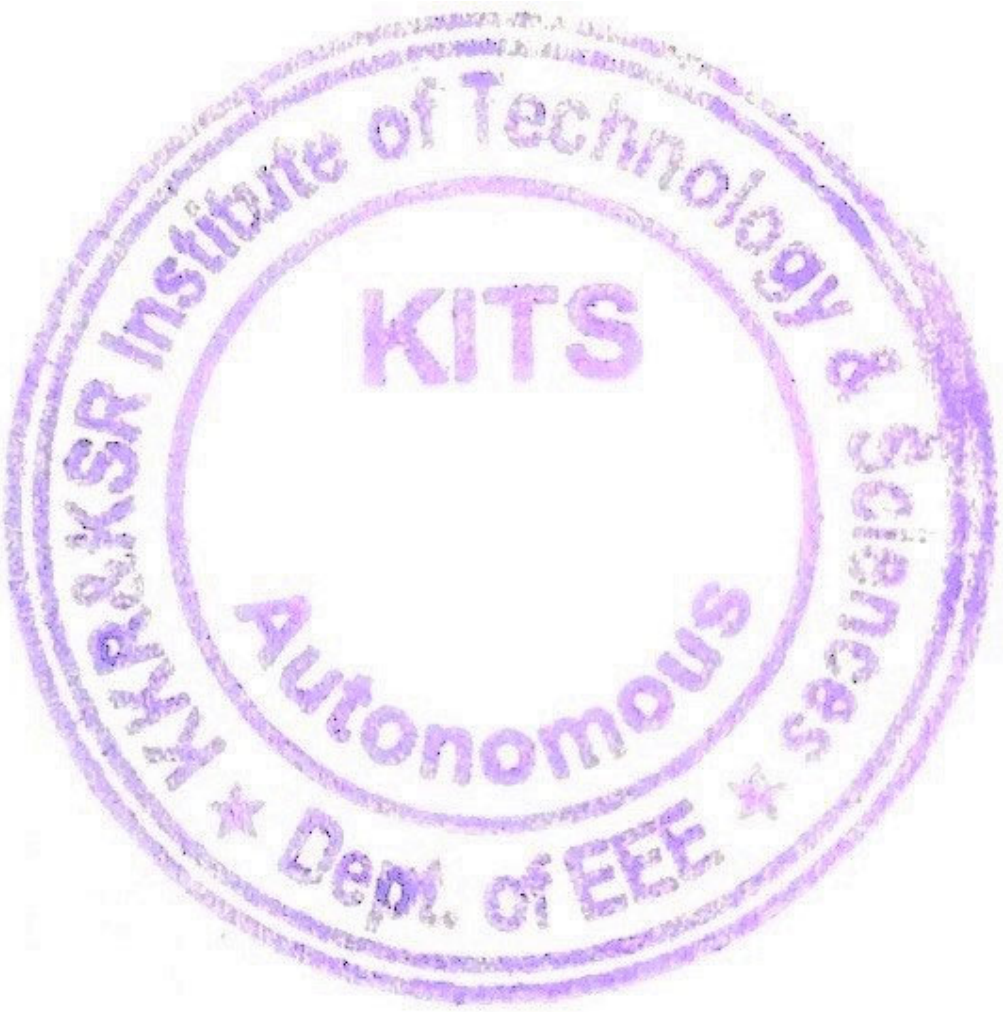
TEXT BOOKS:

1. B. S. Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.

2. B. V. Ramana, Higher Engineering Mathematics, 2007 Edition, Tata Mc. Graw Hill Education.

REFERENCE BOOKS:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 10th Edition, Wiley-India.
2. Dass H.K., Rajnish Verma. Er., Higher Engineering Mathematics, S. Chand Co. Pvt. Ltd, Delhi



DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: I

Course Code	Course Name	L	T	P	C
20EE1T01	Electrical Installation and Electronics Engineering Practice	2	0	2	3

PART A: Electrical Installation

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : realize the limitations, tolerances, electrical tools, safety aspects of electrical systems and wiring

CO2 : select wires/cables and other accessories used in different types of wiring

CO3 : make simple lighting and power circuits

CO4 : initialize backup power supply system

SYLLABUS:

MODULE-I : Electrical Safety, Symbols & Tools

Electrical safety: Safety rules - Safety signs - Hazards - Fire - Types – Extinguishers- Rescue operations - First aid treatment - Artificial respiration- Disposal of waste material - Personal Protective Equipment- Guidelines for cleanliness of workshop and maintenance.

Symbols: Study & identification of electrical circuit symbols – sources, switches, fuses, R, L (coils), C (condensers), various transformers (CT & PT's) - study of various electrical meters with symbolic representations.

Tools: Study of various electrical tools like tester, screw driver, connector screw driver, cutting pliers, combination pliers, Firmer chisel, Electrician knife, soldering rods, hammers, try square and other tools, Trade hand tools - specification – standards (National Electrical Code).

Experiment (s):

1. Study of various electrical tools and symbols

MODULE-II : Electrical wiring - components & its accessories

Identification & selecting the wiring materials: conducting, insulating and semiconductor materials - wiring –PVC casing capping wiring – conduit wiring- types of conduits - concealed wiring - Advantages & dis – advantages - wiring colour codes.

Wiring Accessories: various Switches – (surface, flush, ceiling, push pull, bed switches) – sockets –one-way, two-way, intermediate switch- Holders –pendant, batten holder, socket outlet/plug - link clips, nails, insulation tape- Main switch /main MCB (miniature circuit breaker) – MCCB (molded

case circuit breaker) –ELCB (earth leakage circuit breaker) – RCCB (residual current circuit breaker) – differences & it's –uses.

Experiment (s):

1. Identify different types of cables/wires and switches, fuses & fuse carriers, MCB and ELCB, MCCB with ratings and usage

MODULE-III : Simple lighting and power circuits, Backup power supply system

Connection of lamp using single and two switches- light / fan circuit using two way / three-way control (stair case wiring) - ICTP (Iron clad triple pole) switch - Fixing wiring accessories on board –wiring of power distribution arrangement using single MCB distribution board with ELCB, Main switch and energy. Earthing – Types of Batteries, Important Characteristics of Batteries. Elementary Calculations for Energy Consumption, Battery Backup –Inverter / UPS (uninterrupted power supplies)

Experiment (s):

1. Wiring of light/fan circuit using two way/ three-way control (stair case wiring)
2. Go-down wiring/Tunnel wiring
3. Wiring of power distribution arrangement using single phase MCB distribution board with ELCB, main switch and energy.
4. Wiring of backup power supply including inverter, battery and load for domestic

LIST OF THE EXPERIMENTS

1. Study of various electrical tools and symbols
2. Identify different types of cables/wires and switches, fuses & fuse carriers, MCB and ELCB, MCCB with ratings and usage
3. Wiring of light/fan circuit using two way/ three-way control (stair case wiring)
4. Go-down wiring/Tunnel wiring
5. Wiring of power distribution arrangement using single phase MCB distribution board with ELCB, main switch and energy.
6. Wiring of backup power supply including inverter, battery and load for domestic

REFERENCES

1. Brian Scaddan, IET Wiring Regulations: Electric Wiring for Domestic Installers, 18th ed., Routledge (Taylor & Francis Group), 2018.

2. Electrician- Trade theory (Volume I of II)- NSQF (level - 5), 1st ed., National instructional media institute, 2018.

PART B: Electronics Engineering Practice

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : memorize various passive components

CO2 : classify various active elements

CO3 : operate various measuring devices

CO4 : test the working of the device by soldering

CO5 : examine various outputs using CRO

List of the Experiments

1. Identification of Passive Components

Resistors: - Types of Resistors, Value of Resistance using color code, DRBS.

Capacitors: - Types of capacitors, value of capacitance, DCBS.

Inductors: - Types of Inductors, DLB

Rheostats: - Types of Rheostats, Types of potentiometers, Relays.

Switches: - Types of Switches.

Cables: Types of Cables.

2. Identification of Active elements

Two Terminal Devices: SC diode, Zener diode, DIAC

Three Terminal Devices: BJT, UJT, SCR, FET, MOSFET, TRIAC.

Digital and Analog ICs (TO and Flat packages), IC regulators types.

3. Practicing Laboratory Equipment

A. Meters: -
Types of Voltmeters, Ammeters (Analog & Digital).
Types of Multi meters (Analog & Digital)

B. Laboratory Function Generators and Oscillators.

C. Power Supplies.

D. RF generators.

E. Different Types of Transformers (Power, AF, RF etc).

4. Soldering practice

Requirement:
Tools kit including soldering iron Tools Kit
Insulated nose player
Insulated cutting player
Screw driver kit
Electrical tester

Soldering iron, Lead, Flex

5. **PCB layout and Design.**
   Materials required, Centimeter graph sheets, Marker.

6. **Testing of Components.**
   Active and Passive Components

7. **CRO**
   Acquaintance with CRO and Measurements on CRO.

TEXT BOOKS:

5. J. Millman, C. Halkias, Electronic Devices and Circuits, 2nd ed., Tata Mc-Graw-Hill, 2018.
6. K. Lal Kishore, Electronic Measurements and Instrumentation, Pearson Education 2010.
7. H. (Ted) Smith, Quality hand soldering and circuit board repair, 6th ed., Cengage Learning, 2012.

REFERENCE BOOKS:

4. H. S. Kalsi, Electronic Instrumentation, 2nd ed., Mc-Graw-Hill Education, 2nd Edition 2004.
5. R S Khandpur, Printed Circuit Boards: Design – Fabrication, 1st ed., McGraw Hill Education, 2017.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: I

Course Code	Course Name	L	T	P	C
20CS1T01	Problem Solving and Programming Using C	3	0	0	3

COURSE OUTCOMES:

At the end of the Course, the student will be able to

CO1 : Build algorithms and to draw flowcharts for solving problems

CO2 : Convert flowcharts/algorithms to C Programs, compile and debug programs

CO3 : Use different operators, data types and write programs that use two-way/ multi-way selection

CO4 : Select the best loop construct for a given problem

CO5 : Design and implement programs to analyze the different pointer applications

CO6 : Decompose a problem into functions and to develop modular reusable code

SYLLABUS:

UNIT-I :

Introduction to Computers: Creating and running Programs, Computer Numbering System, Storing Integers, Storing Real Numbers.

Introduction to the C Language: Background, C Programs, Identifiers, Types, Variable, Constants, Input/output, Programming Examples, Type Qualifiers.

Structure of a C Program: Expressions Precedence and Associativity, Side Effects, Evaluating Expressions, Type Conversion Statements, Simple Programs.

UNIT-II :

Bitwise Operators: Exact Size Integer Types, Logical, Bitwise Operators, Shift Operators.

Selection & Making Decisions: Logical Data and Operators, Two Way Selection, Multiway Selection, More Standard Functions.

Repetition: Concept of Loop, Pretest and Post-test Loops, Initialization and Updating, Event and Counter Controlled Loops, Loops in C, Other Statements Related to Looping, Looping Applications, Programming Examples.

UNIT-III :

Arrays: Concepts, Using Array in C, Array Application, Two Dimensional Arrays, Multidimensional Arrays, Programming Example- Calculate Averages

Strings: String Concepts, C String, String Input / Output Functions, Arrays of Strings, String

Manipulation Functions String/ Data Conversion, A Programming Example- Morse Code

Enumerated, Structure, and Union: The Type Definition (Type def), Enumerated Types, Structure, Unions, and Programming Application.

UNIT-IV :

Pointers: Introduction, Pointers to pointers, Compatibility, L value and R value

Pointer Applications: Arrays, and Pointers, Pointer Arithmetic and Arrays, Memory Allocation Function, Array of Pointers, Programming Application.

Processor Commands: Processor Commands.

UNIT-V :

Functions: Designing, Structured Programs, Function in C, User Defined Functions, Inter-Function Communication, Standard Functions, Storage Classes, Scope, life time, Passing Array to Functions, Passing Pointers to Functions, Command Line Arguments, Recursion

Text Input / Output: Files, Streams, Standard Library Input / Output Functions, Formatting Input / Output Functions, Character Input / Output Functions

Binary Input / Output: Text versus Binary Streams, Standard Library, Functions for Files, Converting File Type.

TEXT BOOKS:

1. Programming for Problem Solving, Behrouz A. Forouzan, Richard F.Gilberg, CENGAGE.
2. The C Programming Language, Brian W.Kernighan, Dennis M. Ritchie, 2e, Pearson.

REFERENCE BOOKS:

1. Computer Fundamentals and Programming, Sumithabha Das, Mc Graw Hill.
2. Programming in C, Ashok N. Kamthane, Amit Kamthane, Pearson.
3. Computer Fundamentals and Programming in C, Pradip Dey, Manas Ghosh, OXFORD.

E-Resources:

1. https://www.tutorialspoint.com/cprogramming/index.htm
2. https://www.programiz.com/c-programming
3. https://www.javatpoint.com/c-programming-language-tutorial

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: I

Course Code	Course Name	L	T	P	C
20GE1M01	Environmental Science	2	0	0	0

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : identify the fundamental concepts and the first global initiatives towards sustainable development and the possible means to combat the challenges

CO2 : examine the natural resources, their availability for the sustenance of the life and recognize the need to promote the green technologies to conserve the natural resources

CO3 : assess the concepts of the ecosystem, its function in the environment and the need for protecting various ecosystems

discuss the biodiversity of India and the threats to biodiversity, and conservation practices to protect the biodiversity

CO4 : explain various attributes of the pollution and their impacts and measures to control the pollution along with waste management practices

CO5 : outline the social issues including the environmental legislations of india and environmental assessment and also to investigate the industrial, urban and rural conditions in the surroundings.

SYLLABUS

UNIT-I : Scope and Importance of Environmental Studies

Definition and components of environment, Scope and Importance: Sustainability: Stockholm and Rio Summit: Global Environmental Challenges: Global warming and climate change- Acid rains, Ozone layer depletion, Population Explosion and effects, Role of IT in environmental protection and human health.

UNIT-II : Natural Resources and associated problems

Forest resources: Use and over – exploitation, deforestation – Timber extraction – Mining, dams and other effects on forest and tribal people

Water resources: Use and over utilization of surface and ground water – Floods, drought, conflicts over water, dams – benefits and problems

Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

Food resources: World food problems, changes caused by non-agriculture activities-effects of modern agriculture, fertilizer-pesticide problems,

Energy resources: Growing energy needs, renewable and non-renewable energy sources

Land resources: Land as a resource, land degradation, Wasteland reclamation, man induced landslides, soil erosion and desertification.

UNIT-III : Ecosystems and Biodiversity and its conservation

Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem –Bio geo chemical cycles-Ecological succession. – Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems.

Green Campus and Green Energy. Identification of species by involving in activities like plantation inside or outside the campus.

Biodiversity and its conservation: Definition: genetic, species and ecosystem diversity-classification - Value of biodiversity: consumptive use, productive use, social-India as a mega-diversity nation - Hot-spots of biodiversity- Threats to biodiversity: habitat loss, man-wildlife conflicts - Endangered and endemic species of India – Conservation of biodiversity.

UNIT-IV : Environmental Pollution

Definition, Cause, effects and control measures of **Air pollution, Water pollution, Soil pollution, Noise pollution, Nuclear hazards**. Role of an individual in prevention of pollution. - Pollution case studies,

Solid Waste Management: Sources, Classification, effects and control measures of urban and industrial solid wastes. Consumerism and waste products, Biomedical, Hazardous and e – waste management.

Industrial Disasters and Pollution Case studies: -Bhopal Disaster, Chernobyl accident, Love canal Disaster.

UNIT-V : Environmental Legislation and the Environmental Management

Environmental Protection Act –Air (Prevention and Control of Pollution) Act. –Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act-Issues involved in enforcement of environmental legislation. -Public awareness

Impact Assessment and its significance-various stages of EIA, preparation of EMP and EIS, Eco-tourism.

Visit to an Industry / Urban/Rural/Agricultural Ecosystem and submit a report individually on any

issues or Documentation of Plants and Animals

(Field work Equal to 3 lecture hours).

TEXT BOOKS:

1. Environment Studies, Fourth Edition, Anubha Kaushik, C P Kaushik, New Age International Publishers.
2. A Textbook of Environmental Studies, Shaashi Chawla, TMH, New Delhi.
3. Fundamentals of Environment Studies, Mahua Basu and S. Xavier, Cambridge Publishers, 2014.
4. Textbook of Environmental Science, M. Anji Reddy, B S Publications, Hyderabad.

REFERENCE BOOKS:

1. Text Book of Environmental Studies, Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.
2. A Textbook of Environmental Studies, Shaashi Chawla, TMH, New Delhi
3. Environmental Studies, Benny Joseph, Tata McGraw Hill Co, New Delhi
4. Perspectives in Environment Studies, Anubha Kaushik, C P Kaushik, New Age International Publishers,2014

Semester: I

Course Code	Course Name	L	T	P	C
20SH1L01	English Communicative Skills Lab	0	0	3	1.5

Module - I: Introduction to Phonetics.

a) Brief Introduction to Consonants
b) Brief Introduction to Vowels & Diphthongs

Module - II: Listening Comprehension

a) Comprehending Spoken material in British English.
b) Comprehending Spoken material in American English.
c) Intelligent Listening in Situations.

Module -III: Role – Play / Dialogue Writing

a) Introducing one and others.
b) Asking for and giving information.
c) Asking for and responding to give directions.
d) Seeking permission, requests.
e) Apologizing.

Module - IV: Communication Skills

a) Verbal and Non – verbal communications
b) Barriers of communication.
c) Body Language – Voluntary and Involuntary.

Module - V: Presentation Skills.

a) Extempore
b) JAM Sessions
c) Paper Presentation

Module - VI:

a) Group Discussions: Dos and Don'ts- Types, Modalities
b) Resume Preparation.

References:

1. Infotech English, Maruthi Publications (with Compact Disc).
2. Exercises in Spoken English Part 1,2,3,4, OUP and CIEFL.
3. English Pronunciation in use- Mark Hancock, Cambridge University Press.
4. English Phonetics and Phonology-Peter Roach, Cambridge University Press.
5. English Pronunciation in use- Mark Hewings, Cambridge University Press.
6. English Pronunciation Dictionary- Daniel Jones, Cambridge University Press.
7. English Phonetics for Indian Students- P. Bala Subramanian, Mac Millan Publications.
8. Technical Communication- Meenakshi Raman, Sangeeta Sharma, Oxford University Press.
9. Technical Communication- Gajendrea Singh Chauhan, Smita Kashiramka, Cengage Publications.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: I

Course Code	Course Name	L	T	P	C
20SH1L02	Applied Physics Lab	0	0	3	1.5

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : **memorize** the conditions for sustained interference and diffraction.

CO2 : **understand** the basic concepts of laser.

CO3 : **identify** the properties of various materials.

CO4 : **apply** the concept of dielectrics on the materials.

CO5 : **analyze** the acoustic properties of sound.

LIST OF EXPERIMENTS:

1. Determination of wavelength of a source-Diffraction Grating-Normal incidence.
2. Newton's rings – Radius of Curvature of Plano - Convex Lens.
3. Magnetic field along the axis of a current carrying coil – Stewart and Gee's apparatus.
4. Energy Band gap of a Semiconductor p - n junction.
5. Characteristics of Thermistor – Temperature Coefficients
6. Determination of dielectric constant.
7. LASER - Determination of wavelength by plane diffraction grating
8. Rigidity modulus of material by wire-dynamic method (Torsional pendulum)
9. Verification of laws of vibrations in a stretched string – Sonometer
10. LASER - Determination of particle size using laser.
11. Determination of moment of inertia of a fly wheel.
12. Melde's Experiment – Transverse and longitudinal waves.
13. Determination of time constant – C- R Circuit.
14. I/V Characteristics of ZENAR diode.
15. Determination of Young's Modules of the given Beam – Cantilever.

Note: Minimum 10 experiments mandate

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: I

Course Code	Course Name	L	T	P	C
20CS1L01	Problem Solving and Programming Using C Lab	0	0	3	1.5

COURSE OUTCOMES:

After successful completion of this course, students will be able to

CO1 : gains knowledge on various concepts of a C language

CO2 : draw flowcharts and write algorithms.

CO3 : design and development of C problem solving skills

CO4 : design and develop modular programming skills.

CO5 : trace and debug a program

LIST OF EXPERIMENTS:

Exercise 1:

1. Write a C program to print a block F using hash (#), where the F has a height of six characters and width of five and four characters.
2. Write a C program to compute the perimeter and area of a rectangle with a height of 7 inches and width of 5 inches.
3. Write a C program to display multiple variables.

Exercise 2:

1. Write a C program to calculate the distance between the two points.
2. Write a C program that accepts 4 integers p, q, r and s from the user where r and s are positive and p is even. If q is greater than r and s is greater than p and if the sum of r and s is greater than the sum of p and q print "Correct values", otherwise print "Wrong values".

Exercise 3:

1. Write a C program to convert a string to a long integer.
2. Write a program in C which is a Menu-Driven Program to compute the area of the various geometrical shape.
3. Write a C program to calculate the factorial of a given number.

Exercise 4:

1. Write a program in C to display the n terms of even natural number and their sum.
2. Write a program in C to display the n terms of harmonic series and their sum. 1 + 1/2 + 1/3 + 1/4 + 1/5 ... 1/n terms.

3. Write a C program to check whether a given number is an Armstrong number or not.

Exercise 5:

1. Write a program in C to print all unique elements in an array.
2. Write a program in C to separate odd and even integers in separate arrays.
3. Write a program in C to sort elements of array in ascending order.

Exercise 6:

1. Write a program in C for multiplication of two square Matrices.
2. Write a program in C to find transpose of a given matrix.

Exercise 7:

1. Write a program in C to search an element in a row wise and column wise sorted matrix.
2. Write a program in C to print individual characters of string in reverse order.

Exercise 8:

1. Write a program in C to compare two strings without using string library functions.
2. Write a program in C to copy one string to another string.

Exercise 9:

1. Write a C Program to Store Information Using Structures with Dynamically Memory Allocation
2. Write a program in C to demonstrate how to handle the pointers in the program.

Exercise 10:

1. Write a program in C to demonstrate the use of & (address of) and *(value at address) operator.
2. Write a program in C to add two numbers using pointers.

Exercise 11:

1. Write a program in C to add numbers using call by reference.
2. Write a program in C to find the largest element using Dynamic Memory Allocation.

Exercise 12:

1. Write a program in C to swap elements using call by reference.
2. Write a program in C to count the number of vowels and consonants in a string using a pointer.

Exercise 13:

1. Write a program in C to show how a function returning pointer.

2. Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using malloc () function.

Exercise 14:

1. Write a C program to find sum of n elements entered by user. To perform this program, allocate memory dynamically using calloc () function. Understand the difference between the above two programs
2. Write a program in C to convert decimal number to binary number using the function.

Exercise 15:

1. Write a program in C to check whether a number is a prime number or not using the function.
2. Write a program in C to get the largest element of an array using the function.

Exercise 16:

1. Write a program in C to append multiple lines at the end of a text file.
2. Write a program in C to copy a file in another name.
3. Write a program in C to remove a file from the disk.

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COURSE STRUCTURE AND SYLLABUS

Semester: II

Course Code	Course Name	L	T	P	C
20SH2T04	Applied Chemistry	3	0	0	3

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : understand the importance of plastics and composites in various fields.

CO2 : apply corrosion control methods to protect metals.

CO3 : understand the importance of advanced materials in engineering.

CO4 : understand computational chemistry and importance of molecular machines.

CO5 : understand the use of non-conventional energy sources to produce power.

SYLLABUS

UNIT-I : Polymer Technology

Polymerisation: Introduction-methods of polymerization (emulsion and suspension)-physical and mechanical properties.

Plastics: Compounding-fabrication (compression, injection, blown film, extrusion) - preparation, properties and applications of PVC, polycarbonates and Bakelite-mention some examples of plastic materials used in electronic gadgets, recycling of e-plastic waste.

Elastomers: Natural rubber-drawbacks-vulcanization-preparation, properties and applications of synthetic rubbers (Buna S, thiokol and polyurethanes).

Composite materials: Fiber reinforced plastics-conducting polymers-biodegradable polymers.

UNIT-II : Analytical Techniques and Corrosion

Analytical Techniques: Conductometric titrations – titrations between strong acid and strong base, strong acid and weak base. Potentiometric titrations (redox titrations). Complexometric titrations using EDTA

Corrosion: Definition-theories of corrosion (chemical and electrochemical)-galvanic corrosion, differential aeration corrosion, stress corrosion, waterline corrosion-passivity of metals-galvanic series -factors influencing rate of corrosion-corrosion control (proper designing, cathodic protection)-Protective coatings: Surface preparation, cathodic and anodic coatings, electroplating, electroless plating (nickel). Paints (constituents, functions, special paints).

UNIT-III : Material Chemistry

Non-elemental semiconducting materials: Stoichiometric, controlled valency & chalcogen photo/semiconductors-preparation of semiconductors (distillation, zone refining, Czochralski crystal

pulling, epitaxy, diffusion, ion implantation) - Semiconductor devices (p-n junction diode as rectifier, junction transistor).

Insulators: Electrical insulators- applications.

Nano materials: Introduction-sol-gel method- characterization by BET, SEM and TEM methods applications of graphene-carbon nanotubes and fullerenes: Types, preparation and applications

Liquid crystals: Introduction-types-applications.

Super conductors: Type –I, Type II-characteristics and applications

UNIT-IV : Advanced Concepts/Topics In Chemistry

Computational chemistry: Introduction, Ab Initio studies Molecular switches: characteristics of molecular motors and machines, Rotaxanes and Catenanes as artificial molecular machines, prototypes – linear motions in rotaxanes, an acid-base controlled molecular shuttle, a molecular elevator, an autonomous light-powered molecular motor

UNIT-V : Green Chemistry & Non-Conventional Energy Sources

Green Chemistry: Green synthesis Principles –Applications- 3 or 4 methods of synthesis with examples – R_4M_4 principles

Non-Conventional Energy Sources: Design, working, schematic diagram, advantages and disadvantages of photovoltaic cell, hydropower, geothermal power, ocean thermal energy conversion, tidal and wave power.

TEXT BOOKS:

1. Engineering Chemistry by Jain and Jain; Dhanpat Rai Publicating Co.

REFERENCE BOOKS:

1. Engineering Chemistry by Shikha Agarwal; Cambridge University Press, 2019 edition.
2. Engineering Chemistry by Bharathi kumari Yelamanchili, VGS series.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: II

Course Code	Course Name	L	T	P	C
20SH2T06	Differential Equations	3	0	0	3

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : solve the differential equations and apply differential equations related to various engineering fields

CO2 : solve linear differential equations of second and higher order

CO3 : calculate Jacobian, maxima and minima of functions of two variables

CO4 : solve first order partial differential equations

CO5 : solve the higher order partial differential equations

SYLLABUS

UNIT-I : Differential equations of first order and first degree

Linear differential equations – Bernoulli equations – Exact equations and equations reducible to exact form.

Applications: Newton's Law of cooling - Law of natural growth and decay - Orthogonal trajectories.

UNIT-II : Linear differential equations of higher order

Non-homogeneous equations of higher order with constant coefficients with RHS term of the type e^{ax}, sin ax, cos ax, polynomials in x, e^{ax} V(x), $x^nV(x)$- Method of Variation of parameters.

Applications: L-R circuit, C-R circuit and L-C-R circuit.

UNIT-III : Differential Calculus

Taylors and Mc Laurent's series for one & two variables – Functional dependence – Jacobian.

Applications: Maxima and Minima of functions of two variables with constraints and without constraints.

UNIT-IV : First order Partial differential equations

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – solutions of first order linear (Lagrange) equation and nonlinear (standard type) equations

UNIT-V : Higher order Partial differential equations

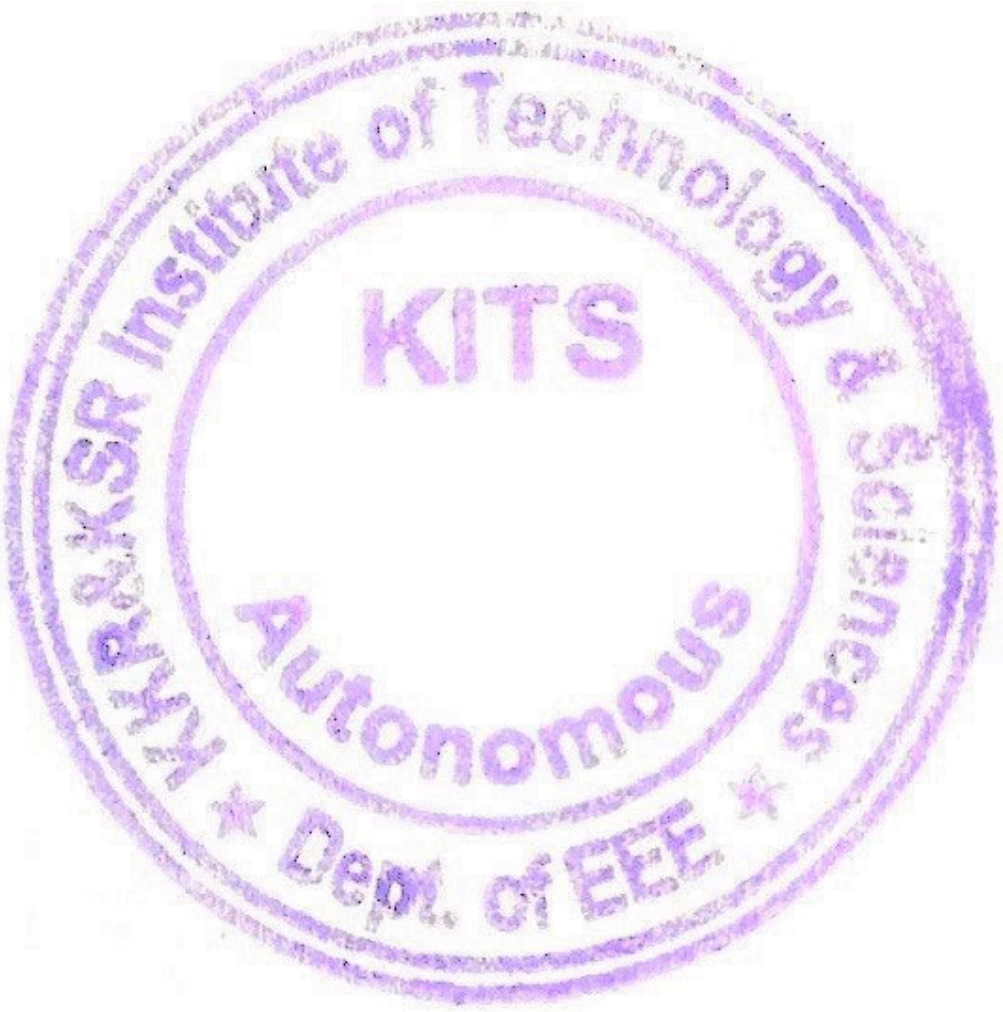
Solutions of Linear Partial differential equations with constant coefficients – RHS terms of the type e^{ax+by} , sin(ax+by), cos(ax+by), x^my^n and Method of separation of Variables.

TEXT BOOKS:

1. **B. S. Grewal,** Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.
2. **B. V. Ramana,** Higher Engineering Mathematics, 2007 Edition, Tata Mc. Graw Hill Education.

REFERENCE BOOKS:

1. **Erwin Kreyszig,** Advanced Engineering Mathematics, 9th Edition, Wiley-India.
2. **Dass H.K., Rajnish Verma. Er.,** Higher Engineering Mathematics, S. Chand Co. Pvt. Ltd, Delhi.
3. **Peter O'Neil,** Advanced Engineering Mathematics, Cengage



DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: II

Course Code	Course Name	L	T	P	C
20ME2T01	Engineering Graphics	3	0	0	3

COURSE OUTCOMES:

After successful completion of this course, students will be able to

CO1 : illustrate the fundamental Engineering Drawing Standards and discuss about conics and scales.

CO2 : draw the projection of points and straight lines

CO3 : draw the projection of planes

CO4 : understand the classification of solids and draw the projection of solids.

CO5 : draw isometric and orthographic projections

SYLLABUS

UNIT-I :

Introduction to Engineering graphics: Conventions in drawing-lettering - BIS conventions.

Polygons: Constructing regular Polygon by general methods

Curves: Conic sections in general method and Cycloid, Involutes tangent and normal for the curves

Scales: Plain scales, Diagonal scales and Vernier scale

UNIT-II :

Introduction to Orthographic Projections; Projections of Points in various quadrants, Projections of Straight Lines parallel to both planes Projections of Straight Lines-Parallel to one and inclined to other plane

Projections of Straight Lines inclined to both planes, determination of true lengths, angle of inclinations and traces

UNIT-III :

Projections of Planes: Regular Planes Perpendicular / parallel to one Reference Plane and inclined to other Reference Plane, Planes inclined to both the Reference Planes.

UNIT-IV :

Projections of solids: Projections of Prisms, Cylinders, with the axis inclined to one Reference Plane. Projections of Pyramids and Cones with the axis inclined to one Reference Plane

UNIT-V :

Conversion of isometric views to orthographic views. Conversion of orthographic views to isometric views.

TEXT BOOKS:

1. Elementary Engineering Drawing By N.D.Bhatt, Charotar Publishing House
2. Engineering Drawing, Agarwal & Agarwal, Tata McGraw Hill Publishers.
3. Engineering Drawing, K.L.Narayana & P. Kannaiah, Scitech Publishers.

REFERENCE BOOKS:

1. A Text Book of Engineering Graphics By P.J.Shah S.Chand & Company Ltd., New Delhi
2. Engineering Graphics I and II by Arunoday Kumar Tech Max Publication, Pune
3. A text book of Engineering Drawing By P.S.Gill S.K.Kataria & sons, Delhi

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: II

Course Code	Course Name	L	T	P	C
20ME2T02	Basic of Mechanical Engineering	3	0	0	3

COURSE OUTCOMES:

After successful completion of this course, students will be able to

CO1 : understand basic laws of thermodynamics and understand the aspects of steam formation and its utilities through the standard steam data tables and charts.

CO2 : classify different types of engines and distinguish them on the basis of their respective working principles

CO3 : understand the working of different types of turbines

CO4 : interpret the application of different manufacturing processes used in the engineering field

CO5 : familiarize with basics of power transmission elements

SYLLABUS

UNIT-I : CONCEPTS OF THERMODYNAMICS

Introduction, states, concept of work, heat and temperature. Zeroth, First and Second Law of thermodynamics, simple problems on First Law of thermodynamics.

Properties of Steam and use of Steam Tables- T-S and H-S Diagrams. Analysis of various Thermodynamic processes under gone by Steam.

UNIT-II : INTERNAL COMBUSTION ENGINES

Classification of IC engines, basic engine components, working principle of engines, Four strokes and two stroke petrol and diesel engines, comparison of CI and SI engines, comparison of four stroke and two stroke engines, simple problems such as indicated power, brake power, friction power, specific fuel consumption, brake thermal efficiency, indicated thermal efficiency and mechanical efficiency

UNIT-III : HYDRAULIC, STEAM AND GAS TURBINES

Classification of Turbines, Working Principle of Hydraulic and Steam turbines –Velocity diagram of Impulse Turbine, Classification of Gas turbine and its functions, methods to improve efficiency of Gas Turbine

UNIT-IV : MACHINE TOOLS AND MANUFACTURING METHODS

Lathe: Classification, specification, lathe operations.

Drilling: Classification, working of radial drilling machine, Various operations performed on drilling machines.

Metal joining: arc welding, gas welding, brazing and soldering

UNIT-V : TRANSMISSION OF POWER

Belt, rope and chain drives- Different types - power transmission by belts and ropes, initial tensions in the belt.

Gear trains: classification of gears, gear trains velocity ratio, simple, compound –reverted and epicyclic gear trains

TEXT BOOKS:

1. Elements of Mechanical Engineering, A.R.Asrani, S.M.Bhatt and P.K.Shah, B.S. Publs**.**
2. Elements of Mechanical Engineering, M.L.Mathur, F.S.Metha&R.P.Tiwari Jain Brothers Publs., 2009**.**
3. Thermal Engineering, Ballaney,P.L., Khanna Publishers, 2003.

REFERENCE BOOKS:

1. Elements of Mechanical Engineering -K R Gopala Krishna ,Subhas Publications
2. Production Technology by P.N.Rao by I & II McGraw-Hill publications
3. Theory of Machines, S.S. Rattan, Tata McGraw Hil., 2004 & 2009

COURSE STRUCTURE AND SYLLABUS

Semester: II

Course Code	Course Name	L	T	P	C
20EE2T01	Network Analysis	3	0	0	3

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : solve electrical networks using various techniques.

CO2 : solve electrical networks using network topology concepts.

CO3 : solve electrical circuits using network theorems with AC and DC excitations.

CO4 : analyze the behavior of RLC networks for sinusoidal excitation.

CO5 : analyze magnetic circuits.

SYLLABUS

UNIT-I : Fundamentals of Electrical Circuits

Active and Passive Components and their V-I Relations - Dependent and Independent Sources - Source Transformation Technique - Network Reduction Techniques-Series, Parallel and Series – Parallel Combination of R, Land C (Each Element Separately) – Star/Delta and Delta/Star Transformation, Nodal Analysis and Mesh Analysis with Dependent and Independent Voltage and Current Sources for Both DC and AC Excitation.

UNIT-II : Network Topology

Definition- Graph- Node – Branch – Links – Twigs - Tree, Co-Tree Basic Cut-Set and Basic Tie-Set Matrices for Planar Networks — Duality & Dual Networks.

UNIT-III : Single Phase A.C Circuits

Sinusoidal Alternating Quantities – Phase and Phase Difference – Complex and Polar Forms of Representations, J-Notation, R.M.S, Average Values and Form Factor for Different Periodic Wave Forms - Concept of Reactance, Impedance, Susceptance and Admittance - Power Factor and Significance-Real and Reactive Power, Complex Power – Simple Problems.

Resonance: Resonance-Series, Parallel Circuits, Concept of Band Width and Q Factor.

UNIT-IV : Network Theorems with DC & AC Excitation

Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer Theorem, Reciprocity Theorem, Millman's Theorem and Compensation Theorem.

UNIT-V : Magnetic Circuits

Basic Definition of MMF, Flux and Reluctance, Analogy Between Electrical and Magnetic Circuits, Faraday's Laws of Electromagnetic Induction – Concept of Self and Mutual Inductance, Dot Convention – Coefficient of Coupling and Composite Magnetic Circuit, Analysis of Series and Parallel Magnetic Circuits.

TEXT BOOKS:

1. Charles K. Alexander, Mathew N.O. Sadiku, Fundamentals of Electric Circuits, 6th ed. Tata McGraw-Hill, 2019.
2. A. Sudhakar and Shyammohan S Palli, Circuits and Networks Analysis & Synthesis, 5th ed. Tata McGraw- Hill, 2017.
3. A. Chakrabarti, Circuit Theory, 7th revised ed. Danapat Rai & Co publisher, 2018.

REFERENCE BOOKS:

1. William Hayt and Jack E.Kemmerley, Engineering Circuit Analysis, 6th ed. (Eighth), Mc Graw Hill Company, 2013.
2. N.C. Jagan, C. Lakshmi Narayana, Network Analysis, 2nd ed. BS publications, 2017.
3. Van Valkenburg, Network Analysis, 3rd ed. Prentice-Hall of India Private Ltd, 2019.
4. Syed A. Nasar, 3000 Solved Problems in Electrical Circuit (Schaum's solved problem series), Tata McGraw-Hill, 2018.

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COURSE STRUCTURE AND SYLLABUS

Semester: II

Course Code	Course Name	L	T	P	C
20SH2L04	Applied Chemistry Lab	0	0	3	1.5

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : estimate unknown solutions by using volumetric titration method.

CO2 : analyze the quality of water.

CO3 : determine the p^H of liquid samples.

CO4 : measure the strength of acids by conductometric and potentiometric titrations.

CO5 : estimate the acid content in fruit juices and soft drinks.

LIST OF EXPERIMENTS

1. Introduction to Chemistry laboratory – Molarity, normality, primary, secondary standard solutions, volumetric titrations, quantitative analysis
2. Estimation of HCl using standard Na_2CO_3 solution.
3. Estimation of alkalinity of a sample containing Na_2CO_3 and NaOH.
4. Estimation of total hardness of water using standard EDTA solution.
5. Estimation of copper using standard EDTA solution.
6. Estimation of zinc using standard EDTA solution.
7. Estimation of Ferrous iron using standard K_2Cr_2O7 solution.
8. Estimation of $KMnO_4$ using standard Oxalic acid solution.
9. Estimation of pH of the given sample solution using pH meter.
10. Conductometric Titrations between strong acid and strong base.
11. Conductometric Titrations between strong acid and Weak base.
12. Preparation of Bakelite.
13. Estimation of acid content in soft drinks.
14. Potentiometric Titrations between ferrous iron with potassium dichromate.
15. Estimation of copper (II) using standard hypo solution.
16. Estimation of iron (III) by colorimetric method.

Note: Any 10 experiments mandate out of 16 experiments

Reference Books

1. A Textbook of Quantitative Analysis, Arthur J. Vogel.
2. Dr.Bharathi Kumari Yelamanchili - Laboratory Manual of Engineering Chemistry, VGS Techno Series

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COURSE STRUCTURE AND SYLLABUS

Semester: II

Course Code	Course Name	L	T	P	C
20ME2L01	Mechanical Engineering Lab	0	0	3	1.5

COURSE OUTCOMES:

After successful completion of this course, students will be able to

CO1 : identify tools and techniques used for sheet metal fabrication.

CO2 : identify various operations performed on lathe and drilling machines.

CO3 : use arc and gas welding equipment.

CO4 : outline the valve timing diagram and port timing diagram of ic engines.

CO5 : explain the different parts of an engine, locations and there working

LIST OF EXPERIMENTS

1. Sheet metal work
   Preparation of sheet metal models:
   a. Cylinder
   b. Hexagonal prism with soldering
   c. Funnel
2. Plain Turning on Lathe Machine
3. Step Turning on Lathe Machine
4. Drilling and Tapping
5. Metal arc welding
   a. Lap joint
   b. Butt joint
6. Gas welding
   a. Lap joint
   b. Butt joint
7. I.C. Engines valve and port timing diagrams
8. Demonstration on Cut section of IC Engine.
9. Demonstration on Water turbines.
10. Demonstration of additive Manufacturing

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COURSE STRUCTURE AND SYLLABUS

Semester: II

Course Code	Course Name	L	T	P	C
20CS2L02	IT Workshop	0	0	3	1.5

COURSE OUTCOMES:

After successful completion of this course, students will be able to

CO1 : Describe evolution of computers, storage devices, networking devices, transmission media and peripherals of a computer.

CO2 : Configure, evaluate and select hardware platforms for the implementation and execution of computer applications, services and systems

CO3 : Construct a fully functional virtual machine, Summarize various Linux operating system commands.

CO4 : Develop presentation, documents and small applications using productivity tools such as word processor, presentation tools, spreadsheets, HTML, LaTex.

LIST OF EXPERIMENTS

Computer Hardware:

Experiment 1: Identification of peripherals of a PC, Laptop, Server and Smart Phones:

Prepare a report containing the block diagram along with the configuration of each component and its functionality, Input/ Output devices, I/O ports and interfaces, main memory, cache memory and secondary storage technologies, digital storage basics, networking components and speeds.

Operating Systems:

Experiment 2: Virtual Machine setup:

- Setting up and configuring a new Virtual Machine
- Setting up and configuring an existing Virtual Machine
- Exporting and packaging an existing Virtual Machine into a portable format

Experiment 3: Operating System installation:

- Installing an Operating System such as Linux on Computer hardware.

Experiment 4: Linux Operating System Commands

- General command syntax, Basic help commands, Basic File system commands, Date and Time
- Basic Filters and Text processing, Basic File compression commands
- Miscellaneous: apt-get, vi editor

Networking and Internet

Experiment 5: Networking Commands

ping, ssh, ifconfig, scp, netstat, ipstat, nslookup, traceroute, telnet, host, ftp, arp.

Internet Services:

Experiment 6:

- Web Browser usage and advanced settings like LAN, proxy, content, privacy, security, cookies, extensions/ plugins
- Antivirus installation, configuring a firewall, blocking pop-ups
- Email creation and usage, Creating a Digital Profile on LinkedIn

Productivity Tools:

Office Tools

Experiment 7:

Demonstration and Practice on Text Editors like Notepad++, Sublime Text, Atom, Brackets, Visual code, etc

Experiment 8:

Demonstration and practice on Microsoft Word, Power Point

Experiment 9:

Demonstration and practice on Microsoft Excel.

Experiment 10:

Demonstration and practice on LaTeX and produce professional PDF documents.

Experiment 11:

Internet of Things (IoT): IoT fundamentals, applications, protocols, Architecture, IoT Devices communication models.

Introduction to HTML:

Experiment 12:

Understanding HTML tags and creation of simple web pages.

Assignment: Develop your home page using HTML Consisting of your photo, name, address and education details as a table and your skill set as a list.

TEXT BOOKS:

1. Computer Fundamentals, Anita Goel, Pearson Education, 2017
2. PC Hardware Trouble Shooting Made Easy, TMH
3. Essential Computer and IT Fundamentals for Engineering and Science Students, Dr.N.B.Vekateswarlu, S.Chand.
4. HTML & CSS, The Complete Reference, Fifth Edition, Thomas A. powell
5. LaTeX Companion – Leslie Lamport, PHI/Pearson.

REFERENCE TEXT BOOKS:

1. B. Govindarajulu, "IBM PC and Clones Hardware Trouble shooting and Maintenance", 2nd edition, Tata McGraw-Hill, 2002.
2. "MOS study guide for word, Excel, Powerpoint& Outlook Exams", Joan Lambert, Joyce Cox, PHI.
3. "Introduction to Information Technology", ITL Education Solutions limited, Pearson Education.
4. Bigelows, "Trouble shooting, Maintaining& Repairing PCs", TMH.
5. Excel Functions and Formulas, Bernd held, Theodor Richardson, Third Edition

E-RESOURCES:

1. https://explorersposts.grc.nasa.gov/post631/20062007/computer_basics/ComputerPorts.doc
2. https://explorersposts.grc.nasa.gov/post631/2006-2007/bitsnbyte/Digital_Storage_Basics.doc
3. https://www.thegeekstuff.com/2009/07/linux-ls-command-examples
4. https://www.pcsuggest.com/basic-linux-commands/
5. https://www.vmware.com/pdf/VMwarePlayerManual10.pdf
6. https://gsuite.google.com/learning-center/products/#!/
7. https://www.raspberrypi.org

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: III

Course Code	Course Name	L	T	P	C
20SH3T03	Numerical Methods and Transformations	3	0	0	3

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : evaluate approximating the roots of polynomial and transcendental equations

CO2 : apply newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals

CO3 : apply different algorithms for approximating the solutions of ordinary differential equations to its analytical computations

CO4 : apply the Laplace transform for solving differential equations

CO5 : find or compute the Fourier series of periodic signals and apply integral expressions for the forwards and inverse Fourier transform to a range of non- periodic waveforms

SYLLABUS

UNIT-I : Iterative methods

Introduction – Bisection method – Iteration method – Newton-Raphson method (One variable) – Jacobi and Gauss-Seidel methods for solving system of equations.

UNIT-II : Interpolation

Introduction – Finite differences – Forward differences – Backward differences – Newton's forward and backward formulae for interpolation – Interpolation with unequal intervals – Lagrange's interpolation formula.

UNIT-III : Numerical integration and solution of ordinary differential equations

Trapezoidal rule – Simpson's 1/3rd and 3/8th rule – Solution of ordinary differential equations by Taylor's series – Picard's method of successive approximations – Euler's method – Runge-Kutta method (second and fourth order).

UNIT-IV : Laplace Transform

Laplace transforms of standard functions-Shifting Theorems, Transforms of derivatives and integrals, Inverse Laplace transforms– Convolution theorem (without proof).

Application: Solutions of ordinary differential equations using Laplace transforms

UNIT-V : Fourier Series

Introduction- Periodic functions – Fourier series of -periodic function - Dirichlet's conditions– Even and odd functions –Change of interval– Half-range sine and cosine series.

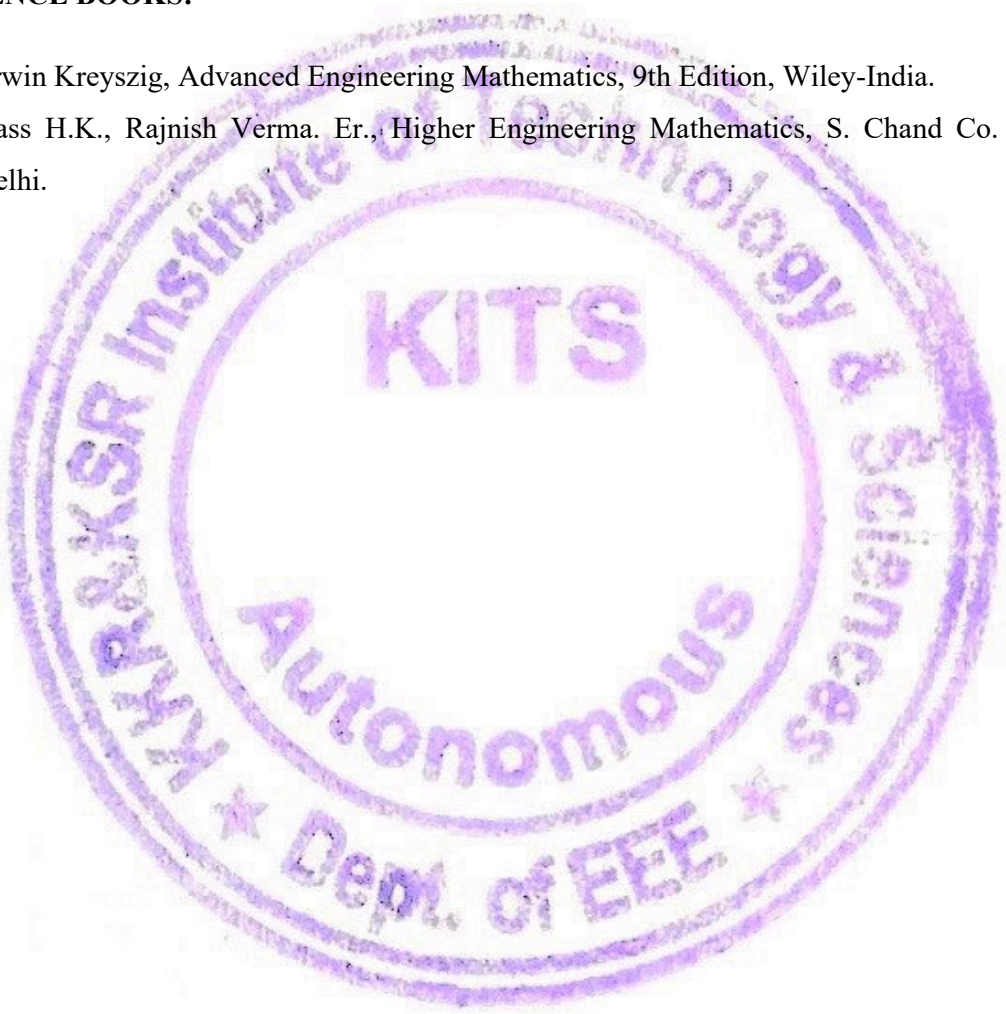
Fourier Transforms: Fourier integral theorem (without proof) – Fourier sine and cosine integrals - sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms.

TEXT BOOKS:

1. B. S. Grewal, Higher Engineering Mathematics, 43rd Edition, Khanna Publishers.
2. B. V. Ramana, Higher Engineering Mathematics, 2007 Edition, Tata Mc. Graw Hill Education.

REFERENCE BOOKS:

1. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, Wiley-India.
2. Dass H.K., Rajnish Verma. Er., Higher Engineering Mathematics, S. Chand Co. Pvt. Ltd, Delhi.



DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: III

Course Code	Course Name	L	T	P	C
20EE3T01	Electrical Circuits and Synthesis	3	0	0	3

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : solve the three phase circuits under balanced & unbalanced conditions.

CO2 : analyze the transient response of electrical circuits for DC excitation.

CO3 : analyze the transient response of electrical circuits for AC excitation.

CO4 : determine the different parameters of two port network.

CO5 : realize the electrical equivalent network for a given network transfer function.

SYLLABUS

UNIT-I : Three Phase Circuits

Balanced Three Phase Circuits: Phase Sequence –Relation Between Line and Phase Voltages, and Currents in Star and Delta Connected System-Analysis of Balanced Three Phase System-Measurement of Active and Reactive Power in Three Phase Systems-Problem Solving.

Unbalanced Three Phase Circuits: Analysis of Three Phase Unbalanced System-Loop Method – Star –Delta Transformation Technique-Two Wattmeter Method for Measurement of Three Phase Power-Problem Solving.

UNIT-II : Transient Analysis in DC Circuits

Transient Response of R-L, R-C, R-L-C Circuits for DC Excitations, Solution Using Differential Equations and Laplace Transforms-Problem Solving.

UNIT-III : Transient Analysis in AC Circuits

Transient Response of R-L, R-C, R-L-C Circuits for AC Excitations, Solution Using Differential Equations and Laplace Transforms-Problem Solving.

UNIT-IV : Two Port Networks

Two Port Network Parameters –Z, Y, ABCD and Hybrid Parameters and their Relations, Cascaded Networks-Pole and Zeros of Network Functions-Problem Solving.

UNIT-V : Network Synthesis

Positive Real Function - Basic Synthesis Procedure - LC Immittance Functions- RC Impedance

Functions and RL Admittance Function – RL Impedance Function and RC Admittance Function - Foster and Cauer Methods.

TEXT BOOKS:

1. William Haytand Jack E. Kemmerley, Engineering circuit analysis McGraw Hill Company, 8th ed., 2013
2. Van Valkenburg, Network synthesis, Prentice-Hall of India Private Ltd, 3rd ed., 2019

REFERENCE BOOKS:

1. A. Sudhakar, Shyammohan S. Pillai, Networks Analysis, 4th ed., McGraw-Hill Companies, 2017.
2. A. Bruce Carlson, Circuits, Cengage Learning Publications, 1st ed., 2011.
3. Smarajit Ghosh, Network Theory Analysis and Synthesis, PHI publications
4. D. Roy Choudhury, Networks and Systems, New Age International publishers, 2nd ed., 2013.
5. David A. Bell, Electric Circuits, Oxford publications, 7th ed., 2009
6. A. Chakrabarthi, Circuit Theory Analysis and Synthesis, 7th Revised ed., Dhanpat Rai & Co, 2018.
7. Charles K. Alexander, Mathew N. O. Sadiku, Fundamentals of Electric Circuits, 6th ed., Mc Graw Hill, 2019.
8. Electric Circuits, 5E (Schaum's Outline Seris) (Sie). The United Kingdom, McGraw-Hill Education (India) Pvt Limited

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: III

Course Code	Course Name	L	T	P	C
20EE3T02	Electrical Machines-I	3	0	0	3

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : demonstrate the principle, construction, operation and characteristics of DC machines.

CO2 : determine the performance of DC machine through different methods

CO3 : distinguish different types of speed control methods of DC machine

CO4 : demonstrate the construction and operation of two winding transformer

CO5 : a. analyze the performance of single-phase transformer

b. demonstrate the operation of three phase transformer

c. achieve three-phase to two phase transformation

SYLLABUS

UNIT-I : Electromechanical Energy Conversion and introduction to DC machines

Principles of electromechanical energy conversion – singly excited and multi excited system – Calculation of force and torque using the concept of co-energy.

Construction and principle of operation of DC machine – EMF equation for generator – Classification of DC machines based on excitation – OCC of DC shunt generator- Problem Solving.

UNIT-II : Performance of D.C. Machines

Torque and back-emf equations of dc motors– Armature reaction and commutation –characteristics of separately-excited, shunt, series and compound motors - losses and efficiency- applications of dc motors.

UNIT-III : Starting, Speed Control and Testing of DC Machines

Necessity of starter – Starting by 3 point and 4-point starters – Speed control by armature

voltage and field control – testing of DC machines - brake test, Swinburne's method – principle of regenerative or Hopkinson's method - retardation test -- separation of losses- Problem Solving.

UNIT-IV : Single Phase Transformers

Types and constructional details - principle of operation - emf equation - operation on no load and on load – lagging, leading and unity power factors loads - phasor diagrams of transformers – equivalent

circuit – regulation – losses and efficiency – effect of variation of frequency and supply voltage on losses – All day efficiency.

UNIT-V : Testing of Transformers and 3-Phase Transformers

Tests on single phase transformers – open circuit and short circuit tests – Sumpner's test – separation of losses- parallel operation with equal voltage ratios – auto transformer –comparison with two winding transformers-- Problem Solving.

Polyphase connections - Y/Y, Y/Δ, Δ/Y, Δ/Δ and open Δ – Scott connection.

TEXT BOOKS:

1. P. S. Bhimbra, Electrical Machinery, 7th ed., Khanna Publications, 2007.
2. S. K. Bhattacharya, Electrical Machines, 3rd ed., Tata McGraw-Hill Education, 2010.
3. A.E.Fitzgerald, Charles kingsley, Stephen D.Umans, Electric Machinery, 6th ed., The McGraw-Hill Companies, 2017.
4. Abhijit Chakrabarti and Sudipta Nath, Electrical Machines, 6th ed., McGraw Hill Education (India) Pvt. Ltd, 2015.

REFERENCE BOOKS:

1. I. L. Kosow, Electrical Machinery and Transformers, 2nd ed., Pearson Education, 2007.
2. I. J Nagarath. and D. P Kothari, Electrical Machines, 5th ed., TMH Publishing Co. Ltd. New Delhi, 2017.
3. J. B. Guptha, Theory & Performance of Electrical Machines, S. K. Kataria & Sons, 2009.
4. B. S. Guru and H. R Hiziroglu, Electrical Machinery and Transformers, 3rd ed., Oxford University Press, 2012.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: III

Course Code	Course Name	L	T	P	C
20EE3T03	Electromagnetic Fields	3	0	0	3

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : determine electric field intensity and electric potential using Gauss's law

CO2 : calculate magnetic field intensity due to current

CO3 : apply ampere' s law, and the Maxwell' s second and third equations in static magnetic field

CO4 : analyze the magnetic forces and torque produced by currents in magnetic field

CO5 : understand the concept of time varying fields and calculate induced EMF's

SYLLABUS

UNIT-I : Electrostatics

Coulomb's Law, Electric Field Intensity, Electrical Field Intensity Due to Point Charges. Line, Surface and Volume Charge Distributions. Maxwell's First Equation $\text{div}(D) = \rho v$, Gauss Law and Its Applications. Potential Difference, Calculation of Potential Differences for Different Configurations, Conservative of Electric Fields, Maxwell's Second Equation Curl (E)=0, Electric Dipole, Electrostatic Energy and Energy Density.

UNIT-II : Current and Conductors, Dielectrics and Capacitance

Polarization- Current and Current Density, Ohms Law in Point Form, Continuity of Current, Boundary Conditions of Perfect Dielectric Materials. Capacitance- Capacitance of a Two Wire Line, Poisson's Equation, Laplace's Equation.

UNIT-III : Magnetostatics

Biot-Savart's Law, Oersted 's Experiment -Ampere's- Circuital Law, Magnetic Flux, Magnetic Field Intensity and Magnetic Flux Density, MFI Due to a Straight Current Carrying Filament – MFI Due to Circular, Square and Solenoid Current – Carrying Wires, Maxwell's Third Equation $\text{Curl}(H) = Jc$.

UNIT-IV : Magnetic Forces, Materials and Inductance

Force on a Moving Charge, Force on a Differential Current Element, Force Between Differential Current Elements, Nature of Magnetic Materials, Magnetization and Permeability, Magnetic

Boundary Conditions, Magnetic Circuits, Self-Inductances and Mutual Inductances, Maxwell's Fourth Equation $\text{Curl}(E) = \partial B/\partial t$.

UNIT-V : Time Varying Fields and Maxwell's Equations

Faraday's Law for Electromagnetic Induction, Displacement Current, Modified Maxwell's Equation in Differential and Integral Forms. Statically and Dynamically Induced EMF's, Maxwell's Equations for Time Varying Fields.

TEXT BOOKS:

1. M. N. O. Sadiku, Elements of Electromagnetics, Oxford University Publication, 2014.
2. W.H. Hayt , J.A Buck, Engineering Electromagnetics, McGraw Hill Education, 2006.

REFERENCE BOOKS:

1. A. Pramanik, Electromagnetism-Problems with solution, Prentice Hall India, 2012.
2. A. Pramanik, Electromagnetism - Theory and applications, PHI Learning Pvt. Ltd, New Delhi, 2009.
3. Yaduvir Singh, Electromagnetic Field Theory, 1st ed., Pearson 2011.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: III

Course Code	Course Name	L	T	P	C
20EC3T04	Analog Electronics	3	0	0	3

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : understand the concepts of the diode and its operation

CO2 : identify the appropriate diode for an application and designing a solution

CO3 : identify the suitable transistor and its configuration that applies to give a solution for a problem.

CO4 : understand the concepts of op-amp and its operation

CO5 : identify the required IC to design and fulfil the given requirement.

SYLLABUS

UNIT-I : Diodes and Their Applications

p-n junction diode, energy band diagram of PN junction Diode, Open circuited p- n junction, Biased p-n junction, diode equation, V-I Characteristics, temperature dependence on V-I characteristics, Diode resistance, Diode capacitance, Diode Applications-Rectifier, Switch, Clipper and Clamper

UNIT-II : Special Diodes Applications

Zener Diode, Breakdown mechanisms, Zener diode applications, LED operation and applications, Photodiode operation and applications, Tunnel Diode operation and applications, UJT operation and applications, Varactor Diode operation and applications SCR operation and applications, Any one applications of LED with Photo Diode

UNIT-III : Transistor and Applications

Transistor: Unipolar Junction Transistors-Bipolar junction Transistors.

BJT: Transistor current components, transistor equation, transistor configurations, Relation between α, β and γ, Transistor as an amplifier, Transistor as a switch, characteristics of Transistor in Common Base, Common Emitter and Common Collector configurations

FET: FET types, construction, operation, characteristics μ, gm, rd parameters, JFET as an Amplifier, JFET as Switch, JFET as Variable Resistor, MOSFET-types, construction, operation, characteristics, comparison between JFET and MOSFET.

UNIT-IV : Operational Amplifier and Applications

OP-Amp Block Diagram (Symbolic Representation), Characteristics of Op-Amp, Ideal and Practical Op-Amp specifications, DC and AC Characteristics, Definitions of Input and Output Off-set voltage and currents slow rate, CMRR,741 Pin diagram.

Op-Amp as Inverting Amplifier, Non-Inverting Amplifier, Adder, differential Amplifier, Instrumentational Amplifier, Comparator, wave generators (Oscillators and Mutlivibrators)

UNIT-V : Timers, VCO, Voltage Regulators & Phase Locked Loops

555 Timer: Introduction to 555 timer, functional diagram, Applications, Monostable and Astable operations and applications, Schmitt Trigger.

78XX: Three-Terminal Voltage Regulators operation and applications

566 IC: -Pin diagram, functional diagram, operation and applications.

565 IC: Pin diagram, functional diagram, operation and applications.

TEXT BOOKS:

1. Electronic Devices and Circuits- J. Millman, C. Halkias, Tata Mc-Graw Hill, SecondEdition,2007
2. Electronic Devices and Circuits-K. Lal Kishore, BS Publications, FourthEdition,2016.
3. Electronics devices & circuit theory- Robert L.Boylestad and Loui Nashelsky, Pearson/Prentice hall, tenth edition,2009
4. Linear Integrated Circuits – D. Roy Choudhury, New Age International (p)Ltd, 2nd Edition,2003.
5. Op-Amps & Linear ICs - Ramakanth A. Gayakwad, PHI,1987.
6. Linear Integrated Circuits by Salivahan-3rd-Edition, McGrawHill,2018

REFERENCES:

1. Integrated Electronics-J. Millman, C. Halkias,Tata Mc-Graw Hill, SecondEdition,2009
2. Electronic Devices and Integrated Circuits – B.P. Singh,Rekha , Pearson publications,
3. Electronic Devices and Circuits-Salivahanan, Kumar, Vallavaraj, Tata Mc-Graw Hill, 4th Edition,2008.
4. Operational Amplifiers & Linear Integrated Circuits –Sanjay Sharma; SK Kataria & Sons; 2nd Edition,2010
5. Operational Amplifiers & Linear Integrated Circuits–R.F.Coughlin & Fredrick Driscoll, PHI, 6th Edition,2000.
6. Operational Amplifiers & Linear ICs – David A Bell, Oxford Uni. Press, 3rd Edition,2011.
7. Linear Integrated Circuits, by Ganesh Babu T.R and Suseela B. Scitech, 5th -Editon, 2014.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: III

Course Code	Course Name	L	T	P	C
20EE3L01	Electrical Circuits and Simulation Lab	0	0	3	1.5

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : determine self and mutual inductances, and resonance frequency

CO2 : solve dc circuits using network theorems

CO3 : calculate three phase power and power factor.

CO4 : compute two port parameters of a given electric circuits

CO5 : simulate

a. the Frequency and Time Response of 2nd Order System Using MATLAB.
b. the network theorems using PSPICE

SYLLABUS

LIST OF EXPERIMENTS

Note: Minimum 10 Experiments mandate

Part-A (Minimum six)

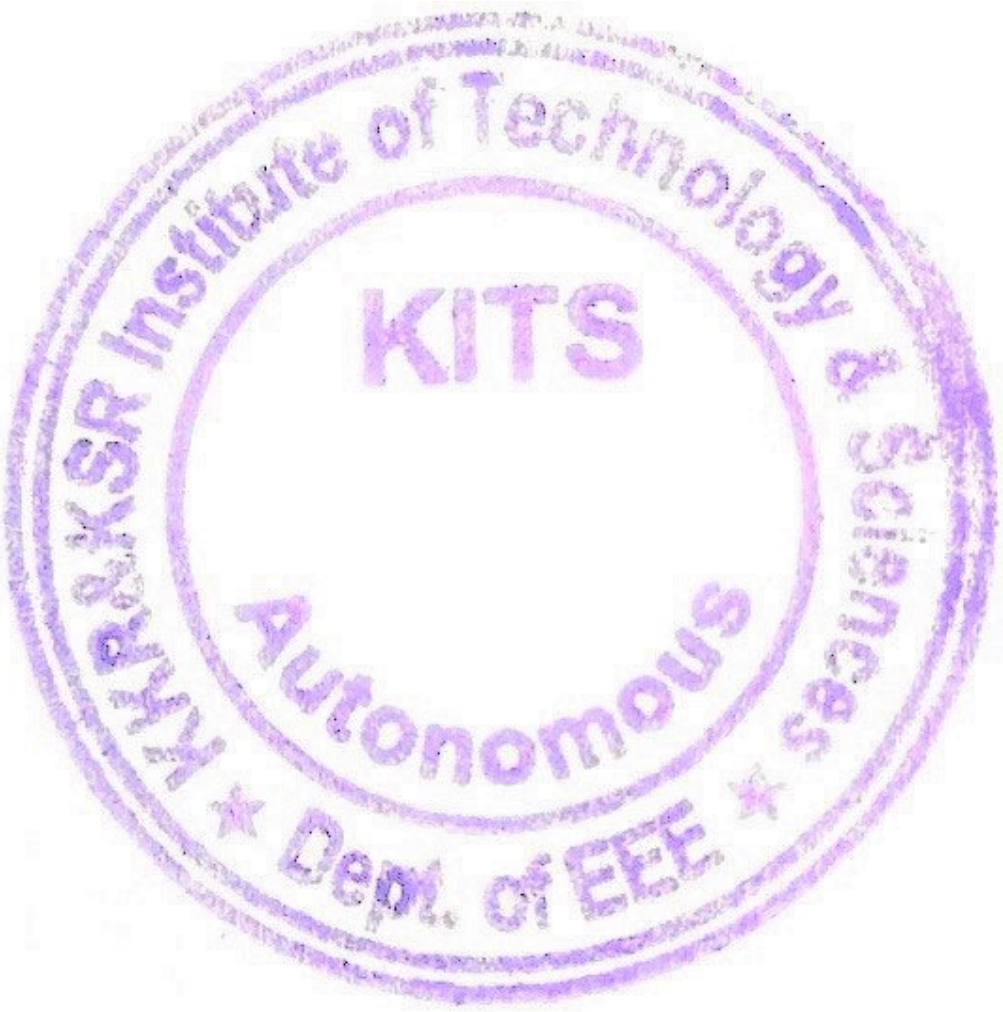
1. Determination of Self, Mutual Inductances and Coefficient of Coupling.
2. Series and Parallel Resonance
3. Experimental Determination of Thevenin's Equivalent
4. Experimental Determination of Norton's Equivalent.
5. Verification of Maximum Power Transfer Theorem
6. Verification of Compensation Theorem.
7. Verification of Reciprocity and Millimann's Theorems.
8. Three Phase Power Measurement by two wattmeter method for unbalanced loads.
9. Three Phase Reactive Power Measurement with Single-Phase Wattmeter.
10. Calculate Impedance and Admittance Parameters of Two-Port Network.
11. Calculate transmission and hybrid Parameters of Two-Port Network.

Part-B (Minimum four)

1. Simulation of Frequency Response of Second Order RLC Circuit Using MATLAB
2. Simulation of Time Response of Second Order RLC Circuit Using MATLAB
3. Verification of Network Theorems Using PSPICE

REFERENCES BOOKS:

1. Laboratory Manual
2. A. Sudhakar, and S. P, Shyam Mohan, Circuits and Networks: Analysis and Synthesis, 4th ed., Tata McGraw Hill Publishing Company Ltd., New Delhi, 2010.



Semester: III

Course Code	Course Name	L	T	P	C
20EE3L02	Electrical Machines Lab-I	0	0	3	1.5

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : determine and predetermine the performance of DC machines

CO2 : draw magnetizing characteristics of DC generator and control the speed of DC motor.

CO3 : analyze the performance and losses by testing of the DC machines

CO4 : determine and predetermine the performance of transformers

CO5 : realize three-phase to two phase transformation.

LIST OF EXPERIMENTS

1. Open Circuit Characteristics of DC Generator (Self and Separately Excited)
2. Load Test on DC Generators.
3. Speed control of D.C. motors using armature control and field control methods
4. a) Brake Test on D.C. Shunt Motor
   b) Brake Test on D.C. Series Motor
5. Swinburne's test
6. Hopkinson test on two identical D.C. machines
7. Retardation test on DC shunt motor
8. Field test on D.C. Series machines.
9. Separation of losses in DC Machine.
10. a) Open circuit & Short circuit test on single phase transformer
    b) Load test on single phase transformer.
11. Sumpner's test on two single phase transformers
12. Separation of core losses of a single-phase transformer
13. Parallel operation of Single-Phase Transformers
14. Scott connection of single-phase transformers

Note: Any ten experiments mandate

REFERENCE(S)

1. Laboratory Manual.
2. S. K. Bhattacharya, Electrical Machines, 3rd ed., Tata McGraw-Hill Education, 2010.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: III

Course Code	Course Name	L	T	P	C
20EC3L04	Analog Electronics Lab	0	0	3	1.5

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : understand the concepts of the diode and its operation

CO2 : identify the appropriate diode for an application and designing a solution

CO3 : identify the suitable transistor and its configuration that applies to give a solution for a problem.

CO4 : understand the concepts of op-amp and its operation

CO5 : identify the required IC to design and fulfil the given requirement.

LIST OF EXPERIMENTS

Note: Minimum of 10 Experiments mandate

PART-A (Any six experiments)

1. Plot the forward and reverse bias characteristics of PN junction diode and determine cut-in voltage(V_γ), static and dynamic resistances.
2. Plot the VI characteristics of Zener diode and construct a regulator with Zener diode.
3. Design a half wave & full wave rectifier and compare ripple factor with and without filter
4. Design a Clipper circuit with diodes.
5. Common emitter configuration characteristics.
6. Common base configuration characteristics.
7. Transistor as an amplifier.
8. Transistor as a switch
9. JFET common source configuration characteristics
10. FET as an amplifier.
11. FET as a switch

PART-B (Any four experiments)

1. Adder and Subtractor using 741 Op-Amp
2. Comparator using 741 Op-Amp
3. Wein Bridge Oscillator using 741 Op-Amp.
4. Astable multi vibrator using 555 IC

5. Monostable multi vibrator using 555 IC
6. Operation 0f 78XX voltage regulators.
7. Any on application of 566 IC
8. Any on application of 565 IC

TEXT BOOKS:

1. Electronic Devices and Circuits- J. Millman, C. Halkias, Tata Mc-Graw Hill, SecondEdition,2007
2. Electronic Devices and Circuits-K. Lal Kishore, BS Publications, FourthEdition,2016.
3. Electronics devices & circuit theory- Robert L.Boylestad and Loui Nashelsky, Pearson/Prentice hall, tenth edition,2009
4. Linear Integrated Circuits – D. Roy Choudhury, New Age International (p)Ltd, 2nd Edition,2003.
5. Op-Amps & Linear ICs - Ramakanth A. Gayakwad, PHI,1987.
6. Linear Integrated Circuits by Salivahan-3rd-Edition, McGrawHill,2018

REFERENCES:

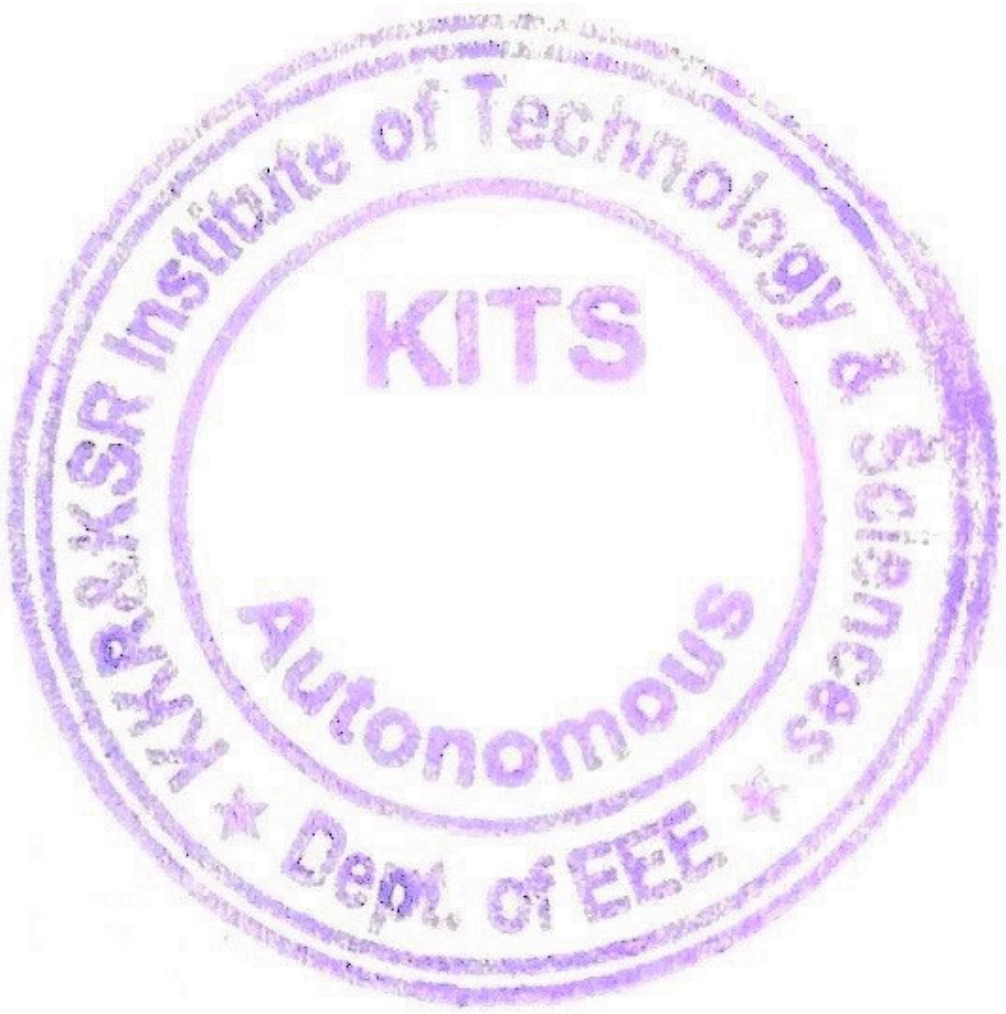
1. Integrated Electronics-J. Millman, C. Halkias,Tata Mc-Graw Hill, SecondEdition,2009
2. Electronic Devices and Integrated Circuits – B.P. Singh,Rekha , Pearson publications,
3. Electronic Devices and Circuits-Salivahanan, Kumar, Vallavaraj, Tata Mc-Graw Hill, 4th Edition,2008.
4. Operational Amplifiers & Linear Integrated Circuits –Sanjay Sharma; SK Kataria& Sons; 2nd Edition,2010
5. Operational Amplifiers & Linear Integrated Circuits–R.F.Coughlin & Fredrick Driscoll, PHI, 6th Edition,2000.
6. Operational Amplifiers & Linear ICs – David A Bell, Oxford Uni. Press, 3rd Edition,2011.
7. LinearIntegrated Circuits, by Ganesh Babu T.R and Suseela B. Scitech, 5th -Editon, 2014.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: III

Course Code	Course Name	L	T	P	C
20EE3S01	MATLAB/Simulink	1	0	2	2



DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: III

Course Code	Course Name	L	T	P	C
20GE3M01	Constitution of India	2	0	0	0

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : Understand historical background of the constitution making and its importance for building a democratic India.

CO2 : Understand the functioning of three wings of the government i.e., executive, legislative and judiciary.

CO3 : Understand the value of the fundamental rights and duties for becoming good citizen of India.

CO4 : Analyze the decentralization of power between central, state and local self-government

CO5 : Apply the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy

SYLLABUS

UNIT-I :

Introduction to Indian Constitution: 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, The Supreme Court and High Court: Powers and Functions;

UNIT-III :

State Government and its Administration Governor - Role and Position - CM and Council of ministers, State Secretariat: Organization, Structure and Functions.

UNIT-IV :

A Local Administration - District's Administration Head - Role and Importance, Municipalities - Mayor and role of Elected Representative - CEO of Municipal Corporation Pachayati Raj: Functions PRI: Zila Panchayat, Elected officials and their roles, CEO Zila Panchayat: Block level Organizational Hierarchy - (Different departments), Village level - Role of Elected and Appointed officials - Importance of grass root democracy

UNIT-V :

Election Commission: Election Commission- Role of Chief Election Commissioner and Election

Commissionerate State Election Commission, Functions of Commissions for the welfare of SC/ST/OBC and women.

REFERENCES:

1. Durga Das Basu, Introduction to the Constitution of India, 12th edition Prentice – Hall of India Pvt. Ltd. New Delhi 2011.
2. Subash Kashyap, Indian Constitution, 2nd edition, National Book Trust, 2011.
3. J.A. Siwach, Dynamics of Indian Government & Politics, 2nd edition, Sterling Pub Private Ltd.,1990.
4. D.C. Gupta, Indian Government and Politics, 8th edition, Vikas Publishing House Pvt Ltd., 2015.
5. H.M.Sreevai, Constitutional Law of India, 4th edition in 3 volumes (Universal Law Publication), 2015.
6. J.C. Johari, Indian Government and Politics Hans, 13th edition, Shoban Lal & Co.2012.
7. J. Raj Indian Government and Politics, 1st edition, SAGE Texts Publication, 2008.
8. M.V. Pylee, Indian Constitution Durga Das Basu, Human Rights in Constitutional Law, 3rd edition, Lexis Nexis Publications, 2008.
9. Noorani, A.G., (South Asia Human Rights Documentation Centre), Challenges to Civil Right), Challenges to Civil Rights Guarantees in India, Oxford University Press 2012

E-RESOURCES:

1. nptel.ac.in/courses/109104074/8
2. nptel.ac.in/courses/109104045/
3. nptel.ac.in/courses/101104065/
4. www.hss.iitb.ac.in/en/lecture-details
5. www.iitb.ac.in/en/event/2nd-lecture-institute-lecture-series-indian-constitution

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: IV

Course Code	Course Name	L	T	P	C
20EE4T01	Electrical Machines-II	3	0	0	3

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : explain the operating characteristics three phase induction machines.

CO2 : distinguish different method of starting and speed control of three induction machines.

CO3 : explain the construction an operating characteristic of a synchronous generator

CO4 : demonstrate the principal operation, characteristics and the phenomenon of synchronous motor

CO5 : differentiate the starting methods of single-phase induction motor

SYLLABUS

UNIT-I : Three Phase Induction Motors

Introduction-Construction Details of Cage and Wound Rotor Machines - Production of Rotating Magnetic Field -Principle of Operation - Rotor EMF and Rotor Frequency - Rotor Current and Power Factor at Standstill and During Running Conditions - Rotor Power Input, Rotor Copper Loss and Mechanical Power Developed and their Interrelationship – Equivalent Circuit – Phasor Diagram-Problem Solving.

UNIT-II : Characteristics, Starting and Testing Methods of Induction Motors

Torque Equation - Expressions for Maximum Torque and Starting Torque - Torque Slip Characteristic - Double Cage and Deep Bar Rotors - Crawling and Cogging – Speed Control of Induction Motor With *V/f* Method – No Load and Blocked Rotor Tests - Circle Diagram for Predetermination of Performance– Methods of Starting – Starting Current and Torque Calculations – Induction Generator Operation (Qualitative Treatment Only).

UNIT-III : Synchronous Generators

Introduction-Constructional Features of Alternators –Principle of Operation –Winding Factors-EMF Equation- Synchronous Reactance-Armature Reaction—Predetermination of Voltage Regulation Using E.M.F, M.M.F, Potier Triangle and ASA Methods–Parallel Operation–Synchronizing Power-Active and Reactive Power Sharing-Alternator on Infinite Bus Bars-Salient Pole Synchronous Machine –Two Reaction Theory-Slip Test–Operating Characteristics-Capability Curves-Problem

Solving.

UNIT-IV : Synchronous Motor

Introduction-Constructional Features of synchronous Motor – Principle of Operation- Methods of Starting–Torque and Power Developed Equations–Effect of Change in Excitation and Load on Synchronous Motor-V Curves and Inverted V Curves–Hunting and Suppression Methods-Synchronous Condenser-Problem Solving.

UNIT-V : Single Phase Induction Motor

Introduction – Constructional Features and Theory of Operation – Equivalent Circuit-Performance Characteristics- Starting Methods, Shaded Pole Motor-Reluctance Motor - Hysteresis Motors-Stepper Motor-AC Series Motor.

TEXT BOOKS:

1. P. S. Bimbhra, Electric Machines, 2nd ed., Khanna Publishing, 2017.
2. M. G. Say, The Performance and Design of Alternating Current Machines: Transformers, Three-Phase Induction Motors and Synchronous Machines. India, CBS Publishers & Distributors, 2005.

REFERENCE BOOKS:

1. J. J. Nagrath and D.P. Kothari, Electric Machines, 4th ed., McGraw Hill Education, 2010
2. V. K Mehta, Rohit Mehta, Principle of Electrical Machines, 2nd ed., S Chand and Company Ltd., 2019.
3. Chakrabarthi and S. Debnath, Electrical Machinery, 1st ed., McGraw Hill, 2015
4. Stephen J Chapman, Electrical Machinery Fundamentals, 5th ed., McGraw Hill Education, 2011

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: IV

Course Code	Course Name	L	T	P	C
20EE4T02	Control Systems	2	1	0	3

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : derive the transfer function of physical systems by applying block diagram and signal flow graph techniques.

CO2 : analysis of system using time domain specifications

CO3 : analysis the stability of system using frequency domain specifications and understand the compensators to improve system performance.

CO4 : analyze absolute and relative stability of LTI systems.

CO5 : examine the concepts of controllability and observability

SYLLABUS

UNIT-I : Mathematical Modeling of Control Systems

Introduction- Type of Control Systems -Open Loop and Closed Loop, Classification of Control Systems, Feedback Characteristics, and Transfer Function of Linear Systems, Differential Equations of Electrical Networks, Translational and Rotational Mechanical Systems, Block Diagram Reduction Techniques, Representation by Signal Flow Graph – Reduction Using Mason's Gain Formula.

UNIT-II : Time Response Analysis

Introduction-Standard Test Signals-Time Response of First Order Systems-Time Response of Second Order Systems-Time Domain Specifications, Steady State Errors and Error Constants, Effects of PI, PD and PID Controllers.

UNIT-III : Frequency Response Analysis and Compensation

Frequency Response: Introduction-Frequency Domain Specifications- Bode Plot-Polar Plots. **Compensation:** Lag, Lead, and Lag-Lead Compensators.

UNIT-IV : Stability Analysis

The Concept of Stability- Location of Poles on s-Plane for Stability- Routh's Stability Criterion-Limitations of Routh's Stability, Root Locus, Nyquist Stability Criterion.

UNIT-V : State Space Analysis

Concepts of State, State Variables and State Model - State Space Representation of Transfer Function - State Transitions Matrix and Its Properties - Concept of Controllability and Observability.

TEXT BOOKS:

1. J. J Nagarath and M. Gopal, Control Systems Engineering, 6th ed., New Age International Publishers, 2017.
2. Benjamin C. Kuo, Automatic Control Systems, 9th ed., Wiley, 2014
3. Katsuhiko Ogata, Modern Control Engineering, 5th ed., Pearson Education India, 2015.

REFERENCE BOOKS:

1. Richard C. Dorf and R. H Bishop, Modern Control Systems, 12th ed., Pearson Education, 2009.
2. John J. D., Azzo Constantine, H. and Houpis Sttuart, N Sheldon, Linear Control System Analysis and Design with MATLAB, 5th ed., CRC Taylor& Francis, 2009.
3. M. Gopal, Control System: Principle and design, 4th ed., McGraw Hill Education, 2012.
4. NPTEL Video Lecture Notes on "Control Engineering" by Prof. S. D. Agashe, IIT Bombay.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: IV

Course Code	Course Name	L	T	P	C
20EC4T04	Digital Electronics	3	0	0	3

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : understand the concepts of logic gates and minimization of Boolean equations

CO2 : identify the appropriate combinational circuit based on its operation for an application and designing a solution

CO3 : design counters and registers that applies to give a solution for a problem.

CO4 : know the diode and transistor switching characteristics

CO5 : understand sampling gates and to design NAND and NOR gates using various logic families.

SYLLABUS

UNIT-I : Logic Gates and Boolean Algebra

Number systems, Conversion of Number Systems, Error detection & correction codes: parity checking, even parity, odd parity, Hamming code. Logic gates, Universal gates, Representation of all gates with universal logic gates, Standard SOP and POS Forms, Boolean theorems Minimization and realization of switching functions using Boolean theorems, K-Map, duality.

UNIT-II : Combinational Logic Circuits Design

Combinations circuit definition, Design process, Adders(half adder, full Adder, 4-bit adder), Subtractor(half subtractor, full subtractor, 4-bit subtractor), Comparator (Single bit, two bit), Decoder(2 x 4, 3 x 8, 4 x 8 with 2 x 4 and 3 x 8), encoder, priority encoder, Multiplexer (2 x 1, 4 x 1, 8 x 1 , 8 x 1 with 4 x 1 and 2 x 1) , Seven Segment Decoder

UNIT-III : Sequential Circuits

Sequential circuit definition, Clock signal, Triggering, latches , flip flops, RS-flip flop, JK- Flip flop, D – Flip flop, T-Flip flop, Conversion from one flip-flop to another flip- flop, Counters, design of synchronous counters and asynchronous counter , Johnson counter, ring counter, Mod-6 Counter and Mod-10 Counter, Registers and shift registers.

UNIT-IV : Switching Characteristics of Devices

Diode as a switch, piecewise linear diode characteristics, Transistor as a switch, break down voltage

consideration of transistor, saturation parameters of Transistor and their variation with temperature, Design of transistor switch, transistor switching times.

UNIT-V : Digital Logic Gate Circuits

Digital Logic gate circuits: Sampling gates, Realization of Logic Gates using DTL, TTL, ECL and CMOS logic circuits, Comparison of logic families.

TEXT BOOKS:

1. Switching and finite automata theory Zvi. Kohavi, Niraj.K.Jha 3rd Edition, Cambridge UniversityPress,2009
2. Digital Design by M. Morris Mano, Michael D Ciletti,4th edition PHIpublication,2008
3. Switching theory and logic design by Hill and Peterson, Mc-Graw Hill TMH edition, 2012.
4. Pulse, Digital and Switching Waveforms - J. Millman and H. Taub, McGraw-Hill, 1991.
5. Solid State Pulse circuits - David A. Bell, PHI, 4th Edn., 2002.

REFERENCES:

1. Fundamentals of Logic Design by Charles H. Roth Jr, JaicoPublishers,2006
2. Digital electronics by R S Sedha. S.Chand & companylimited,2010
3. Switching Theory and Logic Design by A. Anand Kumar, PHI Learning pvtltd,2016.
4. Digital logic applications and design by John M Yarbough, Cengage learning,2006.
5. 1. Pulse and Digital Circuits – A. Anand Kumar, PHI, 2005. 2. Wave Generation and Shaping - L. Strauss.
6. Pulse, Digital Circuits and Computer Fundamentals - R.Venkataraman

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: IV

Course Code	Course Name	L	T	P	C
20CS4T03	Data Structures & Algorithms	3	0	0	3

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : analyze algorithms and describe searching, sorting and hashing techniques

CO2 : describe the concepts of stacks and queues.

CO3 : apply the concepts of linked lists.

CO4 : describe the concepts of trees.

CO5 : explain the concepts of graphs

SYLLABUS

UNIT-I : Analysis of Algorithms

Efficiency of algorithms, A priori Analysis, Asymptotic notations, Time complexity of algorithms using O-notation, Polynomial Vs Exponential algorithms, Average, Best, Worst case complexities, Analyzing recursive programs.

Searching: Introduction, Linear Search, Binary Search, Fibonacci Search.

Internal Sorting: Introduction, Bubble Sort, Insertion Sort, Selection Sort.

Hashing: Introduction, Hash Table Structure, Hash Functions.

UNIT-II : Stacks and Queues

Stacks: Introduction, Stack operations, Applications: Evolutions of Expressions, Expression- Postfix Notation-Infix to Postfix Notation, Infix to Prefix Notation.

Queues: Introduction, Operations on queues, circular queues, Priority queues, Applications.

UNIT-III :

Linked Lists: Introduction, Singly linked lists, Circular linked lists, Doubly linked lists, Multiple linked lists, Applications.

Linked Stacks and Linked Queues: Introduction, Operations on linked stacks and linked queues, Dynamic memory management, Implementation of linked representations, Applications.

UNIT-IV : Trees and Binary Trees, Binary Search Trees and AVL Trees

Trees and Binary Trees: Introduction, Trees: Definition and Basic Terminologies, Representation of trees. Binary trees: Basic terminologies and types, representation of binary trees, binary tree traversals, applications.

Binary Search Trees: Introduction, Binary search trees: Definition and operations, **AVL Trees:** Definition and operations, Applications.

UNIT-V :

Graphs: Introduction, Definitions and basic terminologies, Representations of graphs, Graph traversals and applications.

TEXT BOOKS:

1. Mark Allen Weiss, Data Structures & Algorithm Analysis in C, 2nd Edition, Pearson Education India, 2002.
2. Reema Thareja, Data Structures using C, 2nd Edition, Oxford University Press, India, 2014.

REFERENCES:

1. G.A.V. PAI, Data Structures and Algorithms, Concepts, Techniques and Applications, Volume1,1st Edition, TataMcGraw-Hill,2008.
2. Richard F. Gilberg & Behrouz A. Forouzan, Data Structures, Pseudo code Approach withC,2ndEdition, CengageLearningIndiaEdition,2007.
3. Y. Langsam, M. J. Augenstein, A. M. Tanenbaum, Data structures using C and C++, 2nd Edition, Pearson Education India, 2015.
4. Sartaj Sahni, Ellis Horowitz, Fundamentals of Data Structures in C, 2nd Edition, Orient blacks wan, 2010.

E- REFERENCES:

1. https://www.javatpoint.com/data-structure-tutorial

Semester: IV

Course Code	Course Name	L	T	P	C
20SH4T06	**Principles of Economics & Management**	3	0	0	3

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : adopts the Managerial Economic concepts for decision making and forward planning. Also know law of demand andits exceptions, to use different forecasting methods for predicting demand for various products and services.

CO2 : assess the functional relationship between Production andfactors of production and list out various costs associated withproduction and able to compute BEP and significance of BEA.

CO3 : outline the different types of business organizations and provide a basic insight into national economical activities.

CO4 : familiarize with the concepts of management and to provide basic insight into management practices.

CO5 : provide conceptual knowledge on functional management.

SYLLABUS

UNIT-I : Introduction to Managerial Economics & Demand

Definition, Nature and Scope of Managerial Economics.

Demand Analysis: Definition-types of demand - DemandDeterminants, Law of Demand and its exceptions.

Elasticity of Demand: Definition, Types, Significance of Elasticity of Demand. Demand Forecasting: definition, methods of demand forecasting (survey methods, statistical methods, expert opinionmethod, test marketing, controlled experiments, judgmental approachto demand forecasting)

UNIT-II : Theory of Production and Cost Analysis

Production Function – Law of Variable Proportion, Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Laws of Returns.

Cost Analysis: Types of Cost, Break-even Analysis (BEA)- Determination of Break-Even Point (Simple numerical problems) - Managerial Significance and limitations of BEA.

UNIT-III : Business Environment

Features of Business Organization, Sole Proprietorship, Partnershipand Joint Stock Company, Steps

for formation and Registration of the company.

Monetary Economics: Inflation, GDP, Per-capita Income.

UNIT-IV : Introduction to Management

Concept –nature and importance of Management –Generic Functions of Management – Evolution of Management thought- Theories of Motivation – Decision making process-Designing organization structure- Principles of organization – Organizational typology- Leadership – styles.

UNIT-V : Functional Management

Concept of HRM, HRD and PMIR- Functions of HR Manager – Job Evaluation and Merit Rating. Marketing Management- Functions of Marketing – Marketing strategies based on product Life Cycle, Channels of distributions.

TEXT BOOKS:

1. Dr. N. AppaRao, Dr. P. Vijay Kumar: 'Managerial Economics and Financial Analysis', Cengage Publications, New Delhi – 2011
2. Dr. A. R. Aryasri – Managerial Economics and Financial Analysis, TMH 2011
3. Dr. P. Vijaya Kumar & Dr. N. Appa Rao, 'Management Science' Cengage, Delhi, 2012.
4. Dr. A. R. Aryasri, Management Science' TMH 2011.

REFERENCES:

1. Dr. B. Kuberudu and Dr. T. V. Ramana: Managerial Economics & Financial Analysis, Himalaya Publishing House, 2014.
2. V. Maheswari: Managerial Economics, Sultan Chand.2014
3. Suma Damodaran: Managerial Economics, Oxford 2011.
4. Vanitha Agarwal: Managerial Economics, Pearson Publications 2011.
5. Robins, Stephen P., Fundamentals of Management, Pearson, India.
6. Kotler Philip & Keller Kevin Lane: Marketing Management 12/e, PHI,2007

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: IV

Course Code	Course Name	L	T	P	C
20EE4L01	Electrical Machines Lab-II	0	0	3	1.5

COURSE OUTCOMES:

After Successful Completion of this Course, Students Should be able to

CO1 : draw the operating characteristics of three phase induction machines.

CO2 : calculate the regulation of synchronous generator by using different methods.

CO3 : analyze the performance of synchronous motor.

CO4 : determine the equivalent circuit parameters of single-phase induction motor.

CO5 : draw the performance characteristics of single-phase AC series motor.

LIST OF EXPERIMENTS

1. Brake test on three phase induction motor
2. No–load & blocked rotor tests on three phase induction motor
3. Speed control of induction motor by v/f method.
4. Regulation of a three –phase alternator by synchronous impedance (EMF) & MMF methods
5. Regulation of three–phase alternator by Potier triangle method
6. Determination of efficiency of three-phase alternator by loading with three phase induction motor
7. Parallel operation of three-phase alternator.
8. V and inverted V curves of a three—phase synchronous motor.
9. Determination of X_d and X_q of a salient pole synchronous machine
10. Equivalent circuit of single-phase induction motor
11. Power factor improvement of single-phase induction motor by using capacitors and load test on single-phase induction motor.
12. Brake test on single-phase ac series motor.
13. Starting methods of a capacitor start and capacitor start run single-phase induction motor.
14. Brake test on single-phase induction motor.

Note: Minimum 10 experiments mandate

REFERENCE(S)

1. Laboratory Manual.
2. J. J. Nagrath and D.P. Kothari, Electric Machines, 4th ed., McGraw Hill Education, 2010
3. S. K. Bhattacharya, Electrical Machines, 3rd ed., Tata McGraw-Hill Education, 2010.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: IV

Course Code	Course Name	L	T	P	C
20EC4L03	Digital Electronics Lab	0	0	3	1.5

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : understand the concepts of logic gates and minimization of Boolean equations

CO2 : identify the appropriate combinational circuit based on its operation for an application and designing a solution

CO3 : design counters and registers that applies to give a solution for a problem.

CO4 : know the diode and transistor switching characteristics

CO5 : understand sampling gates and to design NAND and NOR gates using various logic families.

LIST OF EXPERIMENTS

Note: Minimum of 10 Experiments mandate.

PART-A (minimum seven experiments)

1. Verification of truth tables of Logic gates Two input OR, AND, NOR, NAND, Exclusive, Exclusive NOR.
2. Design a simple combinational circuit with three variables and obtain minimal SOP expression and verify the truth table using Digital Trainer Kit.
3. Design a half adder /full adder and verify the truth table
4. Design a four-bit adder and verify the functionality with different inputs
5. Design a four-bit subtractor and verify the functionality with different inputs
6. Verification of functional table of 3 x 8-line Decoder
7. Verification of functional table of 8 x 1 MUX.
8. Draw the circuit diagram of a single bit comparator and test the output
9. Construct 7 Segment Display Circuit Using 7 segment Decoder.
10. Verification of functional tables of JK flip flop
11. Verification of functional tables of T- flip flop
12. Verification of functional tables of D- flip flop
13. Verify the operation of 4-bit Universal Shift Register for different Modes of operation.
14. Design MOD – 8 synchronous counters

PART-B (minimum three experiments)

1. Calculate diode switching times
2. Transistor as inverter/not gate
3. Calculate transistor switching times
4. Realization of Logic Gates using DTL or TTL logic circuits
5. Realization of Logic Gates using ECL or CMOS logic circuits
6. Sampling Gates

TEXT BOOKS:

2. Switching and finite automata theory Zvi. Kohavi, Niraj.K.Jha 3rd Edition, Cambridge UniversityPress,2009.
3. Digital Design by M. Morris Mano, Michael D Ciletti,4th edition PHIpublication,2008.
4. Switching theory and logic design by Hill and Peterson, Mc-Graw Hill TMH edition, 2012.
5. Pulse, Digital and Switching Waveforms - J. Millman and H. Taub, McGraw-Hill, 1991.
6. Solid State Pulse circuits - David A. Bell, PHI, 4th Edn., 2002.

REFERENCES:

1. Fundamentals of Logic Design by Charles H. Roth Jr, JaicoPublishers,2006.
2. Digital electronics by R S Sedha. S.Chand & companylimited,2010
3. Switching Theory and Logic Design by A. Anand Kumar, PHI Learning pvtltd,2016.
4. Digital logic applications and design by John M Yarbough, Cengage learning,2006.
5. Pulse and Digital Circuits – A. Anand Kumar, PHI, 2005. 2. Wave Generation and Shaping - L. Strauss.
6. Pulse, Digital Circuits and Computer Fundamentals - R.Venkataraman

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: IV

Course Code	Course Name	L	T	P	C
20CS4L03	Data Structures & Algorithms Lab	0	0	3	1.5

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : apply recursive and iterative methodologies to solve complex engineering problems.

CO2 : solve searching and sorting techniques and evaluate time & space complexities

CO3 : develop solutions to create and implement operations of linear and nonlinear data structures

CO4 identify and apply suitable data structure for a given real time problem

LIST OF EXPERIMENTS

Exercise 1:

a. Write a recursive C program to calculate Factorial of an integer.

b. Write a recursive C program which computes the n^{th} Fibonacci number, for appropriate values of n.

Exercise 2:

a. Write a recursive C program to calculate GCD (n, m).

b. Write a recursive C program for Towers of Hanoi: N disks are to be transferred from peg S to peg D with Peg I as the intermediate peg.

Exercise 3:

a. Write a C program that implements Selection sort, to sort a given list of integers in ascending order.

b. Write a C program that implements Insertion sort, to sort a given list of integers in ascending order.

Exercise 4:

a. Write a C program that implements Quick sort, to sort a given list of integers in ascending order.

b. Write a C program that implements Radix sort, to sort a given list of integers in ascending order.

c. Write a C program that implements Merge sort, to sort a given list of integers in ascending order.

Exercise 5:

a. Write a C program that implements Stack (its operations) using arrays.

b. Write a C program that uses Stack operations to convert infix expression into postfix expression.

Exercise 6:

a. Write a C program that implements Queue (its operations) using arrays.

b. Write a C program that implements Circular Queue (its operations) using arrays.

Exercise 7:

a. Write a C program that uses functions to create a singly linked list and its operations (insert, delete, search).

b. Write a C program to reverse elements of a singly linked list.

Exercise 8:

a. Write a C program that implements Stack (its operations) using Linked list.

b. Write a C program that implements Queue (its operations) using Linked list.

Exercise 9:

a. Write a C program to create a Circular Linked list and its operations (insert, delete, search).

b. Write a C program to create a Doubly Linked list and its operations (insert, delete, search).

Exercise 10:

a. Write a C program to create a Binary Search Tree and its operations.

b. Write a recursive C program for traversing a Binary Search Tree in preorder, in order and post order.

Exercise 11:

a. Write a C program to perform BFS traversal on given graph.

b. Write a C program to perform DFS traversal on given graph.

TEXT BOOKS:

1. Richard F, Gilberg, Forouzan, Data Structures, 2nd edition, Cengage
2. Aaron M. Tenenbaum, YedidyahLangsam, Moshe J Augenstein, Data Structures usingC, Pearson.
3. Mark Allen Weiss, Data structures and Algorithm Analysis in C, 2nd edition, Pearson Education. Ltd.

REFERENCE BOOKS:

1. Jean-Paul Tremblay Paul G. Sorenson, An Introduction to Data Structures with Applications, 2nd edition, Mc Graw Hill Higher Education
2. Seymour Lipschutz, Data Structure with C, TMH
3. ReemaThareja, Data Structures using C, 2nd edition, Oxford

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE AND SYLLABUS

Semester: IV

Course Code	Course Name	L	T	P	C
20EE4S01	Skill Oriented Course: PLC Programming for Automation	1	0	2	2

COURSE OUTCOMES:

After successful completion of this course, students should be able to

CO1 : Develop PLC ladder logic for realizing various logic gates and switching operations

CO2 : Apply timer and counter instruction for various sequential operations

CO3 : Design various control operation using PLC ladder logic instruction

CO4 : Design a control logic for various process operation

CO5 : Develop a PLC ladder logic for controller operation

LIST OF ACTIVITIES

Note: Minimum of 10 activities mandate.

Required PLC fundamentals shall be explained during the activity.

1. Verify the Logic Gates Using PLC
2. Verify the Latching and Blinking Concepts in Ladder Logic Diagram with Suitable Examples
3. Verify the Timer and Counter Concepts Using PLC with Suitable Examples
4. Write a Ladder Logic Programme for Six Lamps Sequence Operation
5. Implement Star-Delta Starter Controller in PLC Environment
6. Write a Ladder Logic Programme for Operating Conveyor Belt Using PLC
7. Write a Ladder Logic Programme for Elevator Controller Using PLC
8. Write Ladder Logic Programme for 4-Way Traffic Signals Controller in PLC Environment
9. Write a Ladder Logic Programme for a 3 Stage Air Condition System in Function Hall Using PLC
10. Write A Programme for Filling Three Different Water Tanks Using PLC
11. Write a Ladder Logic Programme to Maintain the Water Level with Valve Control Using PLC
12. Write a Ladder Logic Programme for Filling Beverage in a Bottle Using PLC
13. Write a Ladder Logic Programme to Generate Pulse for Controlling DC Motor Speed Using PLC.

TEXT BOOKS:

1. Frank D.Petruzella, Programmable logic controllers, rd ed., McGraw Hill.

2. John W. Webb and Ronald A. Reiss Programmable Logic Controllers – Principle and Applications, Fifth Edition, PHI

REFERENCE BOOKS:

1. JR. Hackworth and F.D Hackworth Jr, Programmable Logic Controllers – Programming Method and Applications. – Pearson, 2004.
2. Gary Dunning, Introduction to Programmable Logic Controllers, Cengage Learning.
3. W.Bolton, Programmable Logic Controllers, Elsevier publisher