VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY HYDERABAD
B.TECH. II YEAR
(ELECTRICAL AND ELECTRONICS ENGINEERING)

III SEMESTER **R18**

Course Code	Title of the Course	L	T	P	Contact Hours/ Week	Credits
18BS1MT05	Complex Analysis and Transforms	3	0	0	3	3
18PC1EE01	Electrical Circuit Analysis	3	1	0	4	4
18PC1EE02	Electromagnetic Fields	3	0	0	3	3
18PC1EC02	Electronic Devices and Circuits	3	0	0	3	3
18PC1EE03	Electrical Machines – I	3	0	0	3	3
18PC1ME16	Fluid Mechanics and Hydraulic Machines	3	0	0	3	3
18PC2EE01	Electrical Circuits and Simulation Laboratory	0	0	2	2	1
18PC2EE02	Electrical Machines-I Laboratory	0	0	2	2	1
18PC2EC06	Electronic Devices Laboratory	0	0	2	2	1
Total		**18**	**1**	**6**	**25**	**22**

IV SEMESTER **R18**

Course Code	Title of the Course	L	T	P	Contact Hours/ Week	Credits
18PC1EE04	Electrical Machines – II	3	0	0	3	3
18PC1EE05	Power Systems-I	3	0	0	3	3
18PC1EC05	Analog Circuits	3	0	0	3	3
18PC1EC06	Digital System Design	3	0	0	3	3
18PC1CS06	Data Structures Through C	3	0	0	3	3
18PC2EE03	Electrical Machines-II Laboratory	0	0	2	2	1
18PC2EC07	Analog Electronics Laboratory	0	0	2	2	1
18PC2EC08	Digital Logic Design Laboratory	0	0	2	2	1
18PC2CS03	Data Structures through C Laboratory	0	0	2	2	1
Total		**15**	**0**	**8**	**23**	**19**
18MN6HS03	Gender Sensitization	0	0	2	2	0

L – Lecture T – Tutorial P – Practical

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(18BS1MT05) COMPLEX ANALYSIS AND TRANSFORMS

COURSE PREREQUISITES: Differentiation, Integration

COURSE OBJECTIVES: Student will gain knowledge of
- Analytic functions and their properties
- Concept of complex integration
- The notion of conformal mapping
- The properties of Fourier transforms
- Classifications and method of solving Partial Differential Equations

COURSE OUTCOMES: After completion of the course, the student will be able to
CO-1: Apply Cauchy-Riemann equations to study analyticity of functions
CO-2: Evaluate contour integrals using Cauchy's integral theorems
CO-3: Analyze the image of the given curve under the given transformation
CO-4: Expand the function as Fourier series
CO-5: Model the problem into PDE and solve it

UNIT-I:
Functions of a Complex Variable: Functions of a complex variable, Continuity, Differentiability, Analyticity, Cauchy-Riemann equations in Cartesian and polar coordinates, Harmonic and conjugate harmonic functions, Milne – Thompson method.

UNIT-II:
Complex Integration, Complex Power Series and Residues: Line integral, evaluation long a path and by indefinite integration. Cauchy's integral theorem, Cauchy's integral formula, generalized integral formula. Expansion of Taylor's series and Laurent series (without proofs). Singular point, isolated singular point, pole of order m, essential singularity. Residues – Evaluation of residue by formulae, Residue theorem, Evaluation of real integrals.

UNIT-III:
Conformal Mapping: Transformation of e^z, lnz, z^2, Sin z, cos z, z + a/z. Basic transformations: Translation, rotation, inversion. Bilinear transformation - fixed point, cross ratio, properties, invariance of circles, determination of bilinear transformation mapping three given points to three assigned points.

UNIT-IV:
Fourier Series: Fourier Series of periodic functions, Euler's formulae, Fourier series of even and odd functions, having arbitrary periods, half range Fourier series.

UNIT-V:
Fourier Transforms: Fourier integral representation of a function, Fourier sine and cosine integral, Complex Fourier transform, Sine and Cosine transforms and their properties, Finite Fourier Transform.

UNIT-VI:

Partial Differential Equations: Partial Differential Equations of second order: Classifications- parabolic, elliptic and hyperbolic, solving partial differential equations using Method of separation of variables. Problems of vibrating string- wave equation.

TEXT BOOKS:

1. J. W. Brown and R. V. Churchill, Complex Variables and Applications, 7th Ed., McGraw-Hill, 2004.
2. Higher Engineering Mathematics - B. S. Grewal, Khanna Publishers, 36th Edition-2010.
3. Higher Engineering Mathematics – B. V. Ramana; Tata McGraw-Hill, New Delhi, 11th Reprint-2010.

REFERENCES:

1. Advanced Engineering Mathematics - Peter O'Neil, (2000), 5th Edition, Cengage Learning.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester	**L**	**T/P/D**	**C**
	3	**1**	**4**

(18PC1EE01) ELECTRICAL CIRCUIT ANALYSIS

COURSE OBJECTIVES:

- To understand Theorems and circuit analysis
- To analyze single phase and three phase ac circuits
- To analyze DC and AC transients in electrical systems
- To evaluate Network parameters of given Electrical network and design of filters

COURSE OUTCOMES: After completion of the course, the student will be able to
CO-1: Apply network theorems for the analysis of electrical circuits
CO-2: Analyse circuits in the sinusoidal steady-state (single-phase and three-phase)
CO-3: Obtain the transient and steady-state response of electrical circuits
CO-4: Analyse two port network behavior and characteristics of filter

UNIT-I:
Network Theorems: Mesh and Nodal analysis, Superposition theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Reciprocity theorem, Compensation theorem with independent and dependant sources (AC and DC Excitations).

UNIT-II:
Magnetic Circuits: MMF, flux, reluctance, Faraday's laws of electromagnetic induction – concept of self and mutual inductance – dot convention – coefficient of coupling – composite magnetic circuit - Analysis of series and parallel magnetic circuit.

UNIT-III:
A.C Circuit Analysis: Review of 1-ph circuits: concept of Resonance in series, parallel circuits, band width and Q factor, locus diagrams.
Three Phase Circuits: Phase sequence – Star and Delta connection – Relation between line and phase voltages and currents in balanced systems – Analysis of balanced and Unbalanced 3 phase circuits – Measurement of Active and Reactive Power- Different methods-Problems

UNIT-IV:
Transient Analysis: Transient response of R-L, R-C, R-L-C circuits (Series and parallel combinations) for D.C. and sinusoidal excitations – Initial conditions - Solution using differential equation approach and Laplace transforms, Response of R-L, R-C, R-L-C circuits for step, ramp, pulse and impulse excitation using Laplace Transforms.

UNIT-V:
Network Functions and Two Port Networks: Network Functions for One-port and Two-port networks, Poles and Zeros of Network Functions, Significance of Poles and Zeros. Two Port Networks, relationship of two port variables, impedance parameters, admittance parameters, transmission parameters and hybrid parameters, interconnections of two port networks.

UNIT-VI:

Filters: Classification of filters – Low pass, High pass, Band pass and Band Elimination, Constant-k and M-derived filters-Low pass and High pass Filters (qualitative and quantitative treatment) and Band pass and Band elimination filters (quantitative treatment only), Illustrative problems.

TEXT BOOKS:

1. Network Analysis by M. E. Van Valkenburg, PHI.
2. Fundamentals of Electric Circuits by C. K. Alexander and M. N. O. Sadiku McGraw-Hill Education, 2004.
3. Engineering Network Analysis and Filter Design by Gopal G.Bhise, Prem R. Chadda, Durgesh C. Kulshreshtha, Umesh Publications

REFERENCES:

1. Engineering Circuit Analysis by W. H. Hayt and J. E. Kemmerly, McGraw-Hill Education, 2013
2. Networks and Systems by D. Roy Choudhury, New Age International Publications, 1998.
3. Circuit Theory by A. Chakrabarti, 6th Edition, Dhanpat Rai and Co.
4. Electrical Circuit Theory by K. Rajeswaran, Pearson Education, 2004.
5. Electric Circuits by Mahmood Nahvi, Joseph A. Edmister, Fifth Edition, Schaum's Outline.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(18PC1EE02) ELECTROMAGNETIC FIELDS

COURSE OBJECTIVES:
- To introduce concepts of electrostatic field
- To introduce concepts of magnetic field
- To understand the concepts of time varying fields
- To appreciate the modifications in Maxwell equation

COURSE OUTCOMES: After completion of the course, the student will be able to
CO-1: To analyze electric fields due to simple charge configurations
CO-2: To obtain magnetic fields and forces due to different configurations
CO-3: To analyze Maxwell's equation in different forms and media
CO-4: To understand the evolve of Faraday's Laws of electromagnetic induction

UNIT-I:
Static Electric Field: Electrostatic Fields-Coulomb's law, Electric Field Intensity (EFI)-EFI due to a Line charge, Surface charge; Work done in moving a point charge in an electrostatic field, Absolute Electric potential and Potential difference, Properties of potential function, Potential gradient, Gauss law and its applications for different configurations, Maxwell's first equation, Div $\mathbf{D}= \rho_V$,Laplace's and Poisson's equations, Solution of Laplace's equation in one variable,

UNIT-II:
Conductors, Dipole, Dielectrics and Capacitance: Electric dipole-EFI, Potential and Torque on an electric dipole; Conductors- Properties when placed in electric field, Current and current densities, Ohms Law in Point form, Continuity equation of current; Dielectric-Polarization, Permittivity of dielectric materials, Boundary conditions of perfect dielectric materials, conductor- dielectric; Capacitance of a parallel plate, spherical and co-axial capacitors with composite dielectrics, Electrostatic Energy stored and Energy density in static electric field

UNIT-III:
Static Magnetic Fields: Static magnetic fields-Biot- Savart's Law and its alternate forms, Magnetic Field Intensity due to straight current carrying filament, MFI due to circular, square and solenoid current carrying wire using Biot Savart's law, Relation between magnetic flux, magnetic flux density and MFI, Maxwell's second equation div $\mathbf{B}$=0, Ampere's Circuital law and its application for MFI due to long current carrying filament& infinite sheet of current,Maxwell's third equation Curl $\mathbf{H}=\mathbf{J_C}$

UNIT-IV:
Magnetic Forces and Magnetic Dipole: Magnetic force-Moving charges in a magnetic field, Lorentz force equation, Force on a differential current element, straight long current carrying conductor in a magnetic field, Force between two straight long and parallel current carrying conductors, Magnetic dipole and dipole moment, Torque on a current loop placed in magnetic field

UNIT-V:

Magnetic Materials and Inductance: Nature of Magnetic materials, Magnetization and permeability, Magnetic boundary conditions, Magnetic Circuits, Energy stored and Energy density, Inductances due to solenoids, toroids and cables, Scalar Magnetic Potential and limitations, Vector Magnetic potentials and properties, Vector magnetic potential due to simple configurations, vector Poison's equations

UNIT-VI:

Time Varying Fields and Maxwell's Equation: Faraday's law for Electromagnetic induction, Its integral and point forms-Maxwell's fourth equation curl $\mathbf{E}=-\delta\mathbf{B}/\delta t$, Statically induced EMF and Dynamically induced EMF-simple problems, Displacement current and Displacement current density, Modification of Maxwell's equations for time varying fields from Gauss Law, Ampere's law, Faraday's law in integral and differential forms, Poynting Theorem and Poynting vector

TEXT BOOKS:

1. William H. Hayt & John A. Buck, Engineering Electromagnetics, McGraw-Hill Companies, 7th Edition, 2006.
2. M. N. O. Sadiku, Elements of Electromagnetics, Oxford University Publication, 2014.

REFERENCES:

1. S. Kamakshaiah, Electromagnetics, Right Publishers, 2007.
2. Pramanik, Electromagnetism-Problems with Solution, Prentice Hall India, 2012.
3. G. W. Carter, The Electromagnetic Field in its Engineering Aspects, Longmans, 1954.
4. W. J. Duffin, Electricity and Magnetism, McGraw Hill Publication, 1980.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(18PC1EC02) ELECTRONIC DEVICES AND CIRCUITS
(Common to ECE and EEE)

COURSE PREREQUISITES: Engineering Physics

COURSE OBJECTIVES:

- To understand the construction, principle of operation and characteristics of various semiconductor devices
- To study the applications of various semiconductor devices
- To have the familiarity with small signal model of semiconductor devices
- To understand the concepts of feedback in amplifiers and oscillators

COURSE OUTCOMES: After completion of the course, the student will be able to

CO-1: Explain the principles of operation and substantiate the applications of various semiconductor devices

CO-2: Appreciate the need for biasing and stabilization

CO-3: Design the application specific circuits using basic active and passive components

CO-4: Explain the necessity of feedback in amplifiers and oscillators

UNIT-I:

PN-Junction Diode and Applications: Review of p-n Junction as a Diode, Diode Equation, Volt-Ampere Characteristics, Temperature dependence of V-I characteristics, Ideal and Practical Diode Equivalent Circuits, Transition and Diffusion Capacitances. Breakdown mechanisms in Semi-Conductor Diodes, Zener Diode Characteristics.

Half wave Rectifier, Full wave rectifier, Bridge Rectifier, Harmonic components in a Rectifier Circuit, Capacitor filters, π- section filters, Zener diode as Voltage Regulator.

UNIT-II:

Bipolar Junction Transistor, Biasing and Stabilization: The Bipolar Junction Transistor(BJT), Transistor Current Components, Transistor Construction, BJT Operation, Common Base, Common Emitter and Common Collector Configurations, Limits of operation, BJT as an Amplifier, BJT Specifications.

DC and AC Load lines, Quiescent operating point, Need for Biasing, Analysis of Fixed Bias, Collector Feedback Bias, Emitter Feedback Bias, Collector-Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Stabilization against variations in V_{BE}, β and I_{CO}, Thermal Runaway, Thermal Stability and Compensation Techniques.

UNIT-III:

Field Effect Transistor, Biasing: Construction and operation of Junction Field Effect Transistor (JFET), Volt-Ampere characteristics- Drain and Transfer Characteristics, FET as Voltage Variable Resistor, FET Biasing, Construction and operation of MOSFET, MOSFET characteristics in Enhancement and Depletion modes.

UNIT-IV:

Small Signal Low Frequency Amplifiers:

BJT Amplifiers:

Small signal low frequency transistor amplifier circuits: h-parameter representation and analysis of single stage CE, CC, CB amplifiers - Computation of voltage gain, current gain, Input impedance and Output impedance; Comparison of CB, CE, CC amplifiers.

JFET Amplifiers:

JFET Small Signal Model, FET Common Source Amplifier, Common Drain Amplifier.

UNIT-V:

Feedback Amplifiers and Oscillators: Concept of feedback, Types of feedback, general characteristics of negative feedback amplifiers, voltage series, voltage shunt, current series and current shunt feedback configurations and their analysis (BJT version), Illustrative problems.

Classification of oscillators, Conditions for oscillations, RC phase shift oscillator, Generalized analysis of LC oscillators – Hartley and Colpitts oscillators, Piezoelectric crystal oscillator, Stability of oscillators.

UNIT-VI:

Special Purpose Semiconductor Devices: Tunnel Diode, Varactor Diode, Photo Diode, Photo Transistor, UJT, LED, SCR

TEXT BOOKS:

1. Electronic Devices and Circuits – J. Millman, Halkias, and Satyabratha Jit, Tata McGraw-Hill, 2nd Edition, 2007.
2. Electronic Devices and Circuits – R. L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall, 11th Edition, 2016.

REFERENCES:

1. Integrated Electronics - J. Millman and Christos C. Halkias, and Chetan D. Parikh Tata McGraw-Hill, 2nd Edition, 2010.
2. Electronic Devices and Circuits – T. F. Bogart Jr., J. S. Beasley and G. Rico, Pearson Education, 6th Edition, 2004.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(18PC1EE03) ELECTRICAL MACHINES-I

COURSE OBJECTIVES:

- To understand the electro-mechanical energy conversion process and operation of DC machines and transformers
- To know the different testing methods for dc machines and transformers
- To know the behavior of DC machines and transformers
- To learn about different method to control the speed of DC motor and voltage of transformers

COURSE OUTCOMES: After completion of the course, the student will be able to
CO-1: To identify the different parts and their role in electro-mechanical energy conversion operation of DC machines and transformers
CO-2: To select DC machines and Transformers for appropriate application
CO-3: To start and control the DC motor speed and transformer output voltage
CO-4: To carry out different assessment tests to predetermine the efficiency of DC machines and transformers

UNIT-I:
Electromagnetism and Electromechanical Energy Conversion: Review of Ampere and Biot Savart Laws, Magnetic field patterns of bar magnet and a current carrying coil - through different media, influence of highly permeable materials on the magnetic flux lines, Linear and Non-linear Magnetization characteristics. Energy stored in the magnetic field, Derivation of Electro-magnetic force in Singly excited electromagnetic systems, Examples, Derivation of Electromagnetic Torque and Reluctance (saliency or eccentricity) Torque in Multi Excited Systems, examples

UNIT-II:
DC Generators-I: Simple Loop generator- commutator action, Armature windings- lap and wave windings, Types of field excitations – separately excited, shunt, series and Compound generators, Open circuit characteristic of separately excited DC generator, voltage build-up in a shunt generator- critical field resistance and critical speed

UNIT-III:
DC Generators-II: Armature reaction- armature MMF wave-MMF wave by Field winding-air gap flux density distribution with armature reaction. Commutation- linear and delayed commutation-Methods of improving commutation, voltage and current characteristics of separately excited, shunt and series and Compound generators

UNIT-IV:
DC Motors: Types of DC motors, Mechanical Power developed, Derivation of Torque equation, Operating characteristics of dc motors. Starting & Speed control of DC motors, Losses, Swin-burne's test- Brake Test- Back-to back test- Field's Test

UNIT-V:

Transformers-I: construction of single-phase transformers, transformer on No-load, Magnetizing current, effect of nonlinear B-H curve of magnetic core material, harmonics in magnetization current, Transformer on Load, phasor diagrams, voltage regulation, losses and efficiency, Open circuit and short circuit tests, polarity test, back-to-back test, separation of hysteresis and eddy current losses, All-Day efficiency

UNIT-VI:

Transformers-II: Parallel operation of single phase transformers, Three-phase transformers, Construction, Open Delta connection, Scott connection, On Load and Off Load Tap-changers, Three-winding transformers, Autotransformers, Cooling of transformers.

TEXT BOOKS:

1. J. Nagrath and D. P. Kothari, "Electric Machines", McGraw-Hill Education, 2010
2. P. S. Bimbhra, "Electrical Machinery", Khanna Publishers, 2011

REFERENCES:

1. E. Fitzgerald and C. Kingsley, "Electric Machinery", New York, McGraw-Hill Education, 2013
2. M. G. Say, "Performance and Design of AC Machines", CBS Publishers, 2002
3. E. Clayton and N. N. Hancock, "Performance and Design of DC Machines", CBS Publishers, 2004

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(18PC1ME16) FLUID MECHANICS AND HYDRAULIC MACHINES

COURSE PREREQUISITES: Mathematics, Physics and Engineering Mechanics

COURSE OBJECTIVES:

- Understand the properties of fluids, principles of buoyancy, flow, force and head calculations.
- Understand the hydro dynamic force and impact of jet.
- Principles of operation of different types of hydraulic turbines.
- Principles of operation of different types of hydraulic pumps.

COURSE OUTCOMES: After completion of the course, the student will be able to

CO-1: Apply the knowledge of fluids and properties to solve flow, force and velocity problems

CO-2: Apply the knowledge to find the head loss due to friction inpipe and other losses

CO-3: Apply the knowledge of fluid flow and dynamics in solving problems in hydraulic machines

CO-4: Perform model analysis of hydraulic machinery and select appropriate machines for hydro power plant

UNIT-I:

Fluid Statics: Properties of fluid – specific gravity, viscosity, surface tension, vapor pressure and their influence on fluid motion, Pressure at a point, measurement of pressure.

Fluid Kinematics: Classification of flows, acceleration equations, Streamline, path line and streak lines and stream tube, continuity equation, Stream function, velocity potential function.

UNIT-II:

Fluid Dynamics: Surface and body forces – Euler's and Bernoulli's equation, Venturimeter, Orifice meter, Pitot tube, Reynolds experiment –Darcy Weisbach equation – Minor losses in pipes – pipes in series and pipes in parallel. Momentum equation.

UNIT-III:

Basics of Turbo Machinery: Hydrodynamic force of jets on flat, inclined and curved vanes - jet striking centrally and at tip, flow over radial vanes.

UNIT-IV:

Elements of Hydroelectric Power Station: Types of power plants, storage requirements, estimation of power from a given catchment area, head and efficiency.

UNIT – V:

Hydraulic Turbines: Classification of turbines, design of Pelton wheel, Francis turbine and Kaplan turbine – working proportion, work done, efficiency, draft tube-theory, functions and efficiency. Geometric similarity, Unit and specific quantities, characteristic curves,

governing of turbines, selection of type of turbine, cavitation, surge tank and water hammer.

UNIT – VI:

Hydraulic Pumps: Classification, centrifugal pumps types, working, work done, manometric head, losses and efficiency, specific speed pumps in series and parallel – performance characteristic curves, NPSH. Reciprocating Pump –types, Working, Discharge, slip, indicator diagrams.

TEXT BOOKS:

1. Hydraulics And Fluid Mechanics Including Hydraulics Machines by P. N. Modi, S. M. Seth, Standard Book House,2009.

REFERENCES:

1. Fluid Mechanics & Hydraulic Machines by R. K. Rajput, S. Chand & Co. Ltd, 3rd Rev. Edition, 2006.
2. Fluid Mechanics - Fundamentals & Applications by Yunus A. Çengel, John M. Cimbala, McGraw-Hill Higher Education, 2006
3. Fluid Mechanics and Hydraulic Machines by R. K. Bansal, Lakshmi Publications, 2005

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester	**L**	**T/P/D**	**C**
	0	**2**	**1**

(18PC2EE01) ELECTRICAL CIRCUITS AND SIMULATION LABORATORY

COURSE OBJECTIVES:

- To design electrical systems
- To analyze a given network by applying various network theorems
- To measure three phase active and reactive power
- To understand the locus diagrams

COURSE OUTCOMES: After completion of the course, the student will be able to
CO-1: Analyze complex DC and AC linear circuits
CO-2: Apply concepts of electrical circuits across engineering
CO-3: Evaluate response in a given network by using theorems
CO-4: Simulate the electrical circuits using suitable software

LIST OF EXPERIMENTS:

1. Verification of Thevenin's and Norton's Theorems
2. Verification of Superposition and Reciprocity theorems
3. Verification of and Maximum Power Transfer and Compensation Theorem
4. Locus Diagrams of RL and RC Series Circuits
5. Series and Parallel Resonance
6. Determination of Self, Mutual Inductances and Coefficient of coupling
7. Determination of Z and Y Parameters
8. Determination of Transmission and Hybrid parameters
9. Measurement of Active Power for Star and Delta connected balanced loads
10. Measurement of Reactive Power for Star and Delta connected balanced loads
11. Simulation of DC circuits and transient analysis.
12. Simulation of circuits using mesh, nodal analysis and Thevenin's theorem.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester	**L**	**T/P/D**	**C**
	0	**2**	**1**

(18PC2EE02) ELECTRICAL MACHINES-I LABORATORY

COURSE OBJECTIVES:

- To expose the students to the operation of DC machines
- To perform different tests on transformers and DC machines
- To know different methods of controlling the speed of DC motors
- To examine the self excitation phenomenon in DC generators

COURSE OUTCOMES: After completion of the course, the student will be able to

CO-1: Start and control the different DC machines

CO-2: Assess the performance of DC machines and transformers using different testing methods

CO-3: Identify different conditions to be satisfied for self-excitation of DC generators

CO-4: Separate iron losses of DC machine into different components

LIST OF EXPERIMENTS:

1. Magnetization characteristics of DC shunt generator
2. Swinburne‘s Test on DC Shunt Machine
3. Speed control of DC Shunt Motor
4. Separation of losses of a DC Shunt Machine
5. Load Test on DC Shunt Generator
6. Load Test on DC Series Generator
7. Hopkinson‘s Test on a Pair of Identical DC Shunt Machines
8. Field‘s Test on a pair of Identical DC Series Machines
9. Open circuit and short circuit tests on single phase Transformer
10. Load Characteristics‘ of DC Compound Generator
11. Brake Test on DC Compound Motor
12. Determination of Voltage Regulation of Single Phase Transformer by direct method

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester	**L**	**T/P/D**	**C**
	0	**2**	**1**

(18PC2EC06) ELECTRONIC DEVICES LABORATORY

COURSE OBJECTIVES:

- To identify various active and passive components
- To understand the functionality of various measuring instruments
- To know the characteristics of various active devices

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

CO-1: Understand the specifications of various devices and measuring equipment

CO-2: Analyze the characteristics of various semiconductor devices

CO-3: Understand the characteristics of various special semiconductor devices

Part A: (Only for viva-voce Examination)
ELECTRONIC WORKSHOP PRACTICE (in 2 lab sessions):

1. Identification, Specification, testing of R,L,C components (colour codes), Potentiometers, Switches (SPDT, DPDT), Relays, Coils, Gang Condenser, Bread Board, PCB.
2. Identification, Specification, testing of Active devices: Diodes, BJT, JFET, MOSFET, Power Transistors, LED, LCD, SCR, UJT.
3. Study and operation of
    1. Function Generator
    2. Regulated Power Supplies
    3. Digital storage oscilloscope (DSO)

Part B: (LIST OF EXPERIMENTS)

1. V-I characteristics of PN junction diode under forward and reverse biased condition
2. V-I characteristics of Zener diode and verify Zener as voltage regulator
3. Half wave Rectifier without filter and with filter: Computation of Ripple factor and percentage regulation
4. Full wave Rectifier without filter and with filter: Computation of Ripple factor and percentage regulation
5. Input and Output characteristics of transistor in CE configuration
6. Input and Output characteristics of transistor in CB configuration
7. Transfer and drain characteristics of JFET
8. Transfer and drain characteristics of MOSFET
9. SCR characteristics
10. UJT characteristics and relaxation oscillator
11. Transistor as a switch
12. Photo diode and photo transistor characteristics

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(18PC1EE04) ELECTRICAL MACHINES-II

COURSE OBJECTIVES:

- To understand the armature windings and the flux patterns in AC machines
- To know the construction and operation of induction and synchronous machines
- To know the different testing methods for induction and synchronous machines
- To know the behavior of induction and synchronous machines

COURSE OUTCOMES: After completion of the course, the student will be able to

CO-1: To identify different parts of ac machines and develop AC windings to establish the rotating magnetic fields

CO-2: To understand the operation of AC machines and assess the performance for appropriate application

CO-3: To start and control the AC machines in view of speed, voltage, active and reactive powers

CO-4: To carry out different assessment tests to predetermine the efficiency of AC machines

UNIT-I:

Fundamentals of AC Machine Windings: A.C armature windings-differences between ac and dc armature windings- single-turn and multi-turn coils - active portion and overhang- winding axis; Pitch Factor-Winding Distribution factor- winding factor; Air-gap MMF distribution with direct current through concentrated, uniformly and Sinusoidally distributed windings- 3D visualization of the above winding types; Production of Pulsating fields- Production of Rotating magnetic Field in Two phase and three phase systems.

UNIT-II:

Three Phase Induction Machines-I: Construction, Types, Torque-Slip Characteristics with different rotor resistances, Starting and Maximum Torques, Equivalent circuit, Phasor Diagram, Losses and Efficiency, Effect of variation of stator voltage, frequency on torque speed characteristics, Circle Diagram

UNIT-III:

Three Phase Induction Machines-II: Methods of starting, Braking, Speed control for induction motors, Cogging and Crawling, Induction Generator operation- Self-excitation, Doubly-Fed Induction Machines (Elementary treatment).

UNIT-IV:

Single-Phase Induction Motors: Constructional features, Cross Field Theory, Split-phase starting methods, Resistance and capacitor split phase motors, shaded pole motors, applications, equivalent circuit-determination of machine parameters.

UNIT-V:

Synchronous Machines-I: Constructional features, types, cylindrical rotor synchronous machine - generated EMF, armature reaction, synchronous impedance, phasor diagram, equivalent circuit, voltage regulation, methods to find voltage regulation,

Analysis of Salient pole machine - two reaction theory, phasor diagram, Slip Test, synchronization, power delivered, power angle characteristics, Effect of change of excitation and fuel input, Short circuit analysis

UNIT-VI:

Synchronous Machines-II: Synchronous motor, principle, Starting of Synchronous Motors, Phasor diagram, V-curves, Synchronous Condenser, Hunting.

TEXT BOOKS:

1. J. Nagrath and D. P. Kothari, "Electric Machines", McGraw-Hill Education, 2010
2. P. S. Bimbhra, "Electrical Machinery", Khanna Publishers, 2011

REFERENCES:

1. M. G. Say, "Performance and design of AC machines", CBS Publishers, 2002
2. E. Fitzgerald and C. Kingsley, "Electric Machinery", New York, McGraw-Hill Education, 2013
3. S. Langsdorf, "Alternating current machines", McGraw-Hill Education, 1984.
4. P. C. Sen, "Principles of Electric Machines and Power Electronics", John Wiley & Sons, 2007.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(18PC1EE05) POWER SYSTEMS-I

COURSE OBJECTIVES:

- To **explain** the various generation sources such as hydro, thermal, nuclear and gas power plants
- To **describe** Transmission line parameters and derive its expressions for various configurations and analyze different types of transmission lines
- To **describe** Travelling wave theory and derive expressions for reflection and refraction coefficients with various terminations of the lines
- To **describe** DC and AC distribution systems and its voltage drop calculations

COURSE OUTCOMES: After completion of the course, the student will be able to
CO-1: Understand the functioning of different power plants
CO-2: Evaluate the performance of Transmission lines and cables
CO-3: Analyze the travelling wave phenomena including corona
CO-4: Assess the performance of DC and AC distribution systems

UNIT-I:
Generation of Electrical Energy: Conventional Power Plants: Operation of Hydel, Thermal, Nuclear and Gas Power plant with layout- Description of TPS components- Choice of site- advantages and Disadvantages. Description of Renewable power generation methods (Qualitative treatment).

UNIT-II:
Transmission Line Parameters: Types of conductors - Calculation of resistance for solid conductors – Calculation of inductance for single phase lines, three phase single circuit and double circuit lines, Transposed lines, concept of GMR and GMD, Skin and Proximity effects. Calculation of capacitance for single phase lines, three phase single circuit and double circuit lines, Transposed lines, Numerical Problems.

UNIT-III:
Performance of Transmission Lines: Classification of Transmission Lines, Performance of Short, Medium lines –Nominal-T and π Networks and A, B, C, D Constants - Numerical Problems. Long Transmission Line-Rigorous Solution, evaluation of A, B, C, D Constants, efficiency and regulation, Representation of Long Lines - Equivalent-T and π network models- Numerical problems - Ferranti effect.

UNIT – IV:
Power System Transients and Corona: Transients - Travelling wave theory - Attenuation, Distortion, Reflection and Refraction Coefficients - Termination of lines with different types of conditions - Open Circuited Line, Short Circuited Line, T-Junction, Lumped Reactive Junctions. Bewley's Lattice Diagrams-Numerical Problems
Corona - Description of the phenomenon, factors affecting corona, critical voltages and power loss - Problems, Radio Interference.

UNIT-V:

Mechanical Design of Oh Lines and UG Cables: Sag and Tension Calculations with equal and unequal heights of towers, Effect of wind and Ice loading; Types of Insulators, String efficiency and Methods of improvement - Capacitance grading and Static Shielding - Numerical Problems.

Construction, Types of Cables, Insulation resistance, Capacitance of Single and 3-Core belted cables. Comparison of Over Head Lines and Under Ground Cables.

UNIT VI:

Distribution Systems: Substations: Air Insulated and Gas Insulated Substations - Layouts – Description – comparison Classification of Distribution Systems - Comparison of DC Vs AC Distribution Systems - Requirements and Design features of Distribution Systems- Voltage Drop Calculations in D.C Distribution system for the following cases-Radial system - fed at one end - fed at both the ends with equal and unequal Voltages, Ring Main Distribution system. Voltage Drop Calculations in A.C. Distribution system, Numerical problems.

TEXT BOOKS:

1. Electrical Power Systems by C. L. Wadhawa New Age International (P) Limited, 1997.
2. A Text Book on Power System Engineering by M. L. Soni, P. V. Gupta, U. S. Bhatnagar and A. Chakraborti, Dhanpat Rai and Co. Pvt. Ltd, 1999

REFERENCES:

1. Modern Power System Analysis by I. J. Nagrath and D. P. Kothari: Tata McGraw-Hill Publishing Company, 2nd Edition.
2. Power System Analysis by John J. Grainger, William D. Stevenson, TMC Companies, 4th Edition
3. Power System Analysis by Hadi Saadat, TMH

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(18PC1EC05) ANALOG CIRCUITS
(Common to ECE and EEE)

COURSE PREREQUISITES: Electronic Devices and Circuits

COURSE OBJECTIVES:

- To understand the principle of multi stage amplification
- To understand the principle of large signal amplification
- To learn about process of wave shaping circuit
- To study the applications of operational amplifier
- To study the IC versions of various waveform generators

COURSE OUTCOMES: After completion of the course, the student will be able to

CO-1: Analyse and compute the parameters of single stage and multistage amplifiers

CO-2: Appreciate the design considerations of various large signal amplifiers

CO-3: Design the wave shaping circuit for a specified output

CO-4: Explain various characteristics of an operational amplifier

CO-5: Appreciate the applications of various linear integrated circuits

UNIT-I:

Frequency Response of BJT Amplifiers: Analysis at low and high frequencies, Effect of coupling and bypass capacitors, Hybrid-π Common Emitter transistor model, CE short circuit gain, CE current gain with resistive load, Single-stage CE transistor amplifier response at high frequencies.

UNIT-II:

Multistage Amplifiers: Introduction, Methods of inter-stage coupling, n-stage cascaded amplifier, Miller's Theorem, CE-CC Amplifier, Darlington Pair.

MOS Amplifiers: MOS Small signal Model, Common source amplifier with Resistive load, Diode connected load, and current source load, Source follower, Cascode Amplifiers.

UNIT-III:

Power Amplifiers: Classification of power amplifiers, Series-fed and Transformer coupled Class A audio power amplifier, Efficiency of Class A amplifier , Class B amplifier, Transformer-coupled Class B push-pull amplifier, Complementary-symmetry Class B push-pull amplifier, Efficiency of Class B amplifier, Cross Over Distortion, Heat sinks.

Tuned Amplifiers: Introduction, Small signal single tuned amplifiers, Double-tuned amplifiers, Effect of cascading single and double tuned amplifiers on bandwidth.

UNIT-IV:

Linear and Non-Linear Wave Shaping: High pass, Low pass RC circuits and their response for sinusoidal, step, pulse, square inputs. RC network as a differentiator and integrator. Attenuators.

Diode clippers, clipping at two independent levels, Transfer characteristics of clippers, Clamping operation, clamping circuits, Clamping circuit theorem.

UNIT-V:

Linear Integrated Circuits: Classification, basic information of Op-amp, ideal and practical Op-amp, internal circuits, Op-amp DC and AC characteristics, modes of operation-inverting, non-inverting, differential.

OP-AMP Applications: Basic application of Op-amp, Instrumentation amplifier, ac amplifier, V to I and I to V converters, Sample and Hold circuits, Differentiators, Integrators, Comparators.

UNIT-VI:

Data Converters and Waveform Generators: D-A and A- D Converters: weighted resistor DAC, R-2R ladder DAC, Different types of ADCs- Successive approximation ADC and Dual slope ADC, Parallel comparator.

Introduction to 555 timer, functional diagram, Mono-stable, As table and Schmitt Trigger operations, PLL – operation and application.

TEXT BOOKS:

1. Integrated Electronics - Jacob Millman and Christos C. Halkias and Chetan D. Parikh, Tata McGraw-Hill Education, 2nd Edition, 2010.
2. Op-Amps and Linear ICs – Ramakanth A. Gayakwad, PHI,1987
3. Pulse, Digital and Switching Waveform, J. Millman, H. Taub; Surya Prakash Rao M., 3rd Edition, McGraw-Hill, 2017.

REFERENCES:

1. Electronic Circuit Analysis - S. Salivahanan, N. Suresh Kumar, Tata McGraw-Hill Education, 3nd Edition, 2013.
2. Linear Integrated Circuits –D. Roy Chowdhury, New Age International (p) Ltd, 4th Edition, 2008.
3. Pulse and Digital Circuits – K. Venkata Rao, K. Rama Sudha, G. Manmadha Rao, Pearson Edition India, 2010.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(18PC1EC06) DIGITAL SYSTEM DESIGN
(Common to ECE, EIE and EEE)

COURSE PREREQUISITES: Basic Electronics

COURSE OBJECTIVES:
- To understand and analyse the logic families
- To understand the different ways of number representation and simplification of Boolean functions with reference to digital circuit design
- To understand the design principles of combinational and sequential circuits
- To understand the role of state machine in digital system designs
- To introduce the principles involved in implementing a digital system using PLDs

COURSE OUTCOMES: After completion of the course, the student will be able to
CO-1: Identify suitable logic family for the implementation of digital ICs
CO-2: Apply the fundamental concepts of digital logic in the design of digital system
CO-3: Analyze and design combinational and sequential logic building blocks of a digital system
CO-4: Apply state machines in the design of digital systems
CO-5: Implement digital systems using various programmable logic devices

UNIT-I:
Digital Logic Families: TTL NAND gate, Specifications, Noise margin, Propagation delay, fan-in, fan-out, Tristate TTL, ECL, CMOS families and their interfacing
Number Systems and Codes: Number Systems, Representation of unsigned and Signed Numbers – Binary Arithmetic, Binary Codes, Code Conversions

UNIT-II:
Switching Functions and Logic Simplification: Boolean Algebra postulates and theorems, Algebraic Simplification, Digital logic gates, Multilevel NAND/NOR realizations, Boolean function representations: Canonical and Standard forms, Karnaugh map up to 5 variables, Don't care combinations.

UNIT-III:
Combinational Circuits: Half Adder, Full Adder, Ripple Carry Adder, Half Subtractor, Full Subtractor, Binary Adder/Subtractor, BCD adder, 4-bit Magnitude Comparator, Encoder, Priority Encoder, Decoder, Multiplexer, De-Multiplexer, Barrel shifter.

UNIT-IV:
Sequential Design: Classification of sequential circuits, Latches and Flip Flops, SR, JK, D, T and Master-Slave JK Flip Flops, Flip-Flop Conversions, Ripple and Synchronous Counters, Shift Registers, Sequence generator and sequence detector. Introduction to Finite State Machines (mealy and Moore).

UNIT – V:

Algorithmic State Machine Charts: Introduction to ASM charts, system Design using data path and control subsystems, ASM charts for Binary Multiplier and Dice Game Controller.

UNIT-VI:

Programmable Logic Devices: Logic implementation using Programmable logic devices (PLDs): Read Only Memory (ROM), Programmable Logic Array (PLA), Programmable Array Logic (PAL), Basic architectures of CPLD and FPGA, FPGA Programming Technologies: SRAM, Antifuse, EPROM

TEXT BOOKS:

1. Digital Design – Morris Mano, PHI, 3rd Edition, 2006.
2. Modern Digital Electronics, R. P. Jain, Tata McGraw-Hill, 4th Edition, 2009.
3. Digital Fundamentals – Floyd and Jain, Pearson Education, 8th Edition, 2009.

REFERENCES:

1. Digital Circuits and Systems, D. V. Hall, Tata McGraw-Hill, 1989.
2. Digital Electronics- An Introduction to Theory and Practice, W. H. Gothmann, PHI, 2nd Edition, 2006.
3. Fundamentals of Logic Design, Charles H. Roth, Larry L. Kinney, 6th Edition, Cengage Learning

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester	**L**	**T/P/D**	**C**
	3	**0**	**3**

(18PC1CS06) DATA STRUCTURES THROUGH C
(Common to EEE, EIE, ME and AE)

COURSE OBJECTIVES:
- To summarize efficient storage mechanisms of data for an easy access
- To familiarize concepts of various linear data structures
- To introduce concept of non-linear data structures
- To develop applications using data structures

COURSE OUTCOMES: After completion of the course, the student will be able to
CO-1: Find time complexity notations for various sorting techniques
CO-2: Implement the operations of creation, insertion, deletion on linear data structures
CO-3: Implement the operations of creation, insertion, deletion on non-linear data structures
CO-4: Implement applications using data structure concepts

UNIT-I:
Data Structures – Introduction to data structures, abstract data types. Asymptotic notations. Merge sort, Quick Sort, Radix sort.

UNIT-II:
Linked List: Singly linked list implementation, insertion, deletion and searching operations on linear list, circular linked list implementation
Double linked list implementation, insertion, deletion and searching operations. Applications of Linked Lists – Polynomial addition and subtraction**.**

UNIT–III:
Stacks: Operations, array and linked representations of stacks, stack applications-infix to postfix conversion, postfix expression evaluation, Towers of Hanoi recursive implementation.

UNIT–IV:
Queues: operations, array and linked representations of queues. Circular queue operations, dequeue operations.

UNIT–V:
Trees: Definitions, binary tree representation, binary search tree, binary tree traversals- Preorder, Inorder, Postorder.

UNIT–VI:
Graphs: Definitions, graph representations, spanning tree, graph traversals- BFS and DFS.

TEXT BOOKS:

1. C Programming & Data Structures, B. A. Forouzan and R. F. Gilberg, Third Edition, Cengage Learning.
2. Data Structures Using C (Paperback) by Aaron M. Tenenbaum

REFERENCES:

1. C & Data Structures – P. Padmanabham, Third Edition, B. S. Publications.
2. Data Structures using C – A. M. Tanenbaum, Y. Langsam, and M. J. Augenstein, Pearson Education
3. C Programming & Data Structures, E. Balagurusamy, TMH.
4. C Programming & Data Structures, P. Dey, M. Ghosh R. Thereja, Oxford University Press
5. C & Data Structures – E. V. Prasad and N. B. Venkateswarlu, S. Chand & Co.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester	**L**	**T/P/D**	**C**
	0	**2**	**1**

(18PC2EE03) ELECTRICAL MACHINES- II LABORATORY

COURSE OBJECTIVES:

- To understand the operation of synchronous machines
- To know different methods of finding voltage regulation of synchronous generators
- To understand different testing methods to assess electrical machines
- To learn how to convert phase between 3 to 2 and vice-versa

COURSE OUTCOMES: After completion of the course, the student will be able to

CO-1: Assess the performance of different machines using different testing methods

CO-2: Convert the phase from 3 phase to 2 phase and vice-versa

CO-3: Compensate the changes in terminal voltages of synchronous generator after estimating the change by different methods

CO-4: Start different machines and Control the active and reactive power flows in synchronous machines

LIST OF EXPERIMENTS:

1. Sumpner's test on two identical single-phase transformers
2. Scott-connected Transformer
3. Seperation of Iron losses of a single phase transformer
4. No-Load and blocked rotor tests on three-phase squirrel-cage Induction Motor. Analysis through equivalent circuit diagram.
5. No-Load and blocked rotor tests on three-phase squirrel-cage Induction Motor. Analysis through Circle diagram
6. Brake test on three phase slip ring induction motor
7. Speed Control of three phase slip ring Induction Motor
8. Regulation of three-phase Alternator by synchronous impedance method.
9. Regulation of three-phase Alternator by ZPF Method
10. Slip test on three-phase salient pole Alternator
11. **V** and inverted **V** curves of a three-phase synchronous motor
12. Equivalent circuit and Brake test on Single-phase Induction Motor

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester	**L**	**T/P/D**	**C**
	0	**2**	**1**

(18PC2EC07) ANALOG ELECTRONICS LABORATORY

COURSE OBJECTIVES:

- To explain the operation, design and Analysis of multistage amplifiers using BJT
- To understand the operation of power amplifiers and its efficiency
- To understand the operation of IC 741 and its applications
- To understand the working principle of 555 timer

COURSE OUTCOMES: After completion of the course, the student will be able to
CO-1: Design and analyze multi-stage amplifier circuits
CO-2: Analyze and design application specific circuits using Op-Amp
CO-3: Design the Active filters using Op-Amp
CO-4: Design applications using IC 555 Timer

Part A:
Design and simulation of the following circuits using simulation software and implementation through hardware

1. BJT amplifier in CE configuration
2. Two stage RC-coupled amplifier
3. Darlington amplifier
4. MOSFET amplifier configuration

Part B:
Implement the following

1. Linear wave shaping (Low pass-RC and High pass-RC circuit)
2. Non linear wave shaping-clippers and clampers
3. Integrator and differentiator using IC 741 Op-amp
4. Square wave and triangular wave generation using Op-amp
5. R-2R Ladder D-A converter
6. Monostabe and Astable multi-vibrator using IC 555 timer
7. Schmitt trigger circuit using IC 555 timer
8. Colpitts oscillator

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester	**L**	**T/P/D**	**C**
	0	**2**	**1**

(18PC2EC08) DIGITAL LOGIC DESIGN LABORATORY

COURSE OBJECTIVES:

- To learn VERILOG hardware description language
- To understand the design of combinational and Sequential Circuits through different specifications
- To design digital circuits using CAD tools
- To understand & implement the finite state machine

COURSE OUTCOMES: After completion of the course, the student will be able to
CO-1: Develop VERILOG HRL code to design a combinational system
CO-2: Develop VERILOG HDL Code to design a digital system
CO-3: Understand the design flow of CAD tools for digital system design
CO-4: Analyze the importance of Finite State machine

LIST OF EXPERIMENTS:

Design and simulate the following circuits

1. Logic Gates-(Universal gates and Ex-OR gate)
2. Full Adder and Full Subtractor
3. Code converter (Binary to Gray)
4. Multiplexer (4x1 MUX) and De-Multiplexer(1x4 D-MUX)
5. Encoder and Decoder
6. Parity Generator
7. 4-bit comparator
8. Flip-flops (JK & D) using truth table and state diagram
9. Up & down counter
10. Decade counter
11. Shift registers (Universal)
12. Mealy state Machine

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING & TECHNOLOGY

B.Tech. IV Semester	**L**	**T/P/D**	**C**
	0	**2**	**1**

(18PC2CS03) DATA STRUCTURES THROUGH C LABORATORY
(Common to EEE, EIE, ME and AE)

COURSE OBJECTIVES:
- To **impart** the implementation of data structures such as linked lists, Stacks and Queue
- To **introduce** the various advanced data structures such as tree traversals
- To **analyze** the sorting algorithms
- To **teach** the various graph traversal algorithms

COURSE OUTCOMES: After completion of the course, the student will be able to
CO-1: Analyze the algorithms to determine the time and space complexities
CO-2: Implement the linear data structures like stacks, queues and linked lists
CO-3: Evaluate the non-linear data structures like Trees and graphs
CO-4: Predict the tree and graph traversing techniques

WEEK 1
1. Write a C program for Merge Sort

WEEK 2
2. Write a C Program for Quick Sort
3. Write a C program for Radix Sort

WEEK 3
4. Write a C program for SLL creation, insertion, deletion, searching, display operations.

WEEK 4
5. Write a C program for CLL creation, insertion, deletion, searching, display operations.

WEEK 5
6. Write a C program for DLL creation, insertion, deletion, searching, display operations.

WEEK 6
7. Write a C program to implement STACK operations using arrays and Linked List.

WEEK 7
8. Write a C Program for infix to postfix conversion.

WEEK 8
9. Write a C program for postfix evaluation.
10. Write a C program for tower of Hanoi problem

WEEK 9
11. Write a C program to implement QUEUE operations using arrays and LL.

WEEK 10

12. Write a C program to implement CIRCULAR QUEUE operations using arrays.

WEEK 11

13. Write a C program to implement DEQUEUE operations using arrays.

WEEK 12

14. Write a C program to implement Binary tree traversals using recursion.

WEEK 13

15. Write a C program to implement Graph traversals (BFS and DFS).

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. IV Semester	**L**	**T/P/D**	**C**
	0	**2**	**0**

(18MN6HS03) GENDER SENSITIZATION

COURSE DESCRIPTION:
This course offers an introduction to Gender Studies, an interdisciplinary field that asks critical questions about the meanings of sex and gender in society. The primary goal of this course is to familiarize students with key issues, questions and debates in Gender Studies, both historical and contemporary. It draws on multiple disciplines – such as literature, history, economics, psychology, sociology, philosophy, political science, anthropology and media studies – to examine cultural assumptions about sex, gender, and sexuality. This course integrates analysis of current events through student presentations, aiming to increase awareness of contemporary and historical experiences of women, and of the multiple ways that sex and gender interact with race, class, caste, nationality and other social identities. This course also seeks to build an understanding and initiate and strengthen programmes combating gender-based violence and discrimination. The course also features a number of exercises and reflective activities designed to examine the concepts of gender, gender-based violence, sexuality, and rights. It will further explore the impact of gender-based violence on education, health and development.

ACTIVITIES:
Classes will consist of a combination of activities: dialogue-based lectures, discussions, collaborative learning activities, group work and in-class assignments.

COURSE OBJECTIVES:
- To sensitize students on issues of gender in contemporary India
- To provide a critical perspective on the socialization of men and women
- To expose the students to debates on the politics and economics of work
- To enable students to reflect critically on gender violence
- To expose students to more egalitarian interactions between men and women

COURSE OUTCOMES: After completion of the course, the student will be able to
CO-1: Understand important issues related to gender in contemporary India
CO-2: Attain a finer grasp of how gender discrimination works in our society and how to counter it
CO-3: Acquire insight into the gendered division of labour and its relation to politics and economics
CO-4: Respond to put an end to gender violence
CO-5: Equipped to work with the other gender treating them as equals

MODULE 1: Introduction to Gender
 Definition of Gender
 Basic Gender Concepts and Terminology
 Exploring Attitudes towards Gender
 Social Construction of Gender

MODULE 2: Gender Roles and Relations
 Types of Gender Roles

 Gender Roles and Relationships Matrix
 Gender-based Division and Valuation of Labour

MODULE 3: Gender Development Issues
 Identifying Gender Issues
 Gender Sensitive Language
 Gender, Governance and Sustainable Development
 Gender and Human Rights
 Gender and Mainstreaming

MODULE 4: Gender-based Violence
 The concept of violence
 Types of Gender-based violence
 The relationship between gender, development and violence
 Gender-based violence from a human rights perspective

MODULE 5: Gender and Culture
 Gender and Film
 Gender and Electronic Media
 Gender and Advertisement
 Gender and Popular Literature

MODULE 6: Gender and Studies
 Knowledge: Through the Lens of Gender Point of View, Gender and the Structure of Knowledge
 Whose History: Questions for Historians and Others, Reclaiming a Past, Writing Other Histories

TEXT BOOK:
1. "Towards a World of Equals: A Bilingual Textbook on Gender", A. Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu, Telugu Akademi, Telangana Government, 2015.

REFERENCES:
1. Sen, Amartya. "More than One Million Women are Missing." New York Review of Books 37.20 (20 December 1990). Print. 'We Were Making History...' Life Stories of Women in the Telangana People's Struggle. New Delhi: Kali for Women, 1989.
2. Tripti Lahiri. "By the Numbers: Where Indian Women Work." Women's Studies Journal (14 November 2012) Available online at: http://blogs.wsj.com/India real time/2012/11/14/by-the-numbers-where-India-women-work/>
3. Abdulali Sohaila "I Fought For My Life ...and Won. "Available online at: http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulal/
4. K. Kapadia. The Violence of Development: the Politics of Identity, Gender and Social Inequalities in India. London: Zed Books, 2002.
5. T. Banuri and M. Mahmood, Just Development: Beyond Adjustment with a Human Face, Karachi: Oxford University Press, 1997