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

III SEMESTER **A19**

Course Code	Title of the Course	L	T	P/D	Contact Hours/ Week	Credits
A19BS1MT09	Complex Analysis and Transforms	3	0	0	3	3
A19PC1EE01	Electromagnetic Fields	3	1	0	4	4
A19PC1EE02	Electrical Machines – I	3	0	0	3	3
A19PC1EC02	Electronic Devices and Circuits	3	0	0	3	3
A19PC1EC03	Digital System Design	3	0	0	3	3
A19PC2EE01	Electrical Machines-I Laboratory	0	0	3	3	1.5
A19PC2EC01	Electronic Devices and Circuits Laboratory	0	0	3	3	1.5
A19PC2EC15	Digital Logic Design Laboratory	0	0	2	2	1
Total		**15**	**1**	**8**	**24**	**20**

IV SEMESTER **R19**

Course Code	Title of the Course	L	T	P/D	Contact Hours/ Week	Credits
A19PC1EE03	Electrical Machines – II	3	0	0	3	3
A19PC1EE04	Power Systems-I	3	1	0	4	4
A19PC1EC06	Analog Circuits	3	0	0	3	3
A19PC1ME18	Fluid Mechanics and Hydraulic Machines	3	0	0	3	3
A19HS1MG02	Engineering Economics and Accountancy	3	0	0	3	3
A19PC2EE02	Electrical Machines-II Laboratory	0	0	3	3	1.5
19PC2EC05	Analog Circuits Laboratory	0	0	3	3	1.5
A19PC2IT02	Python Programming Laboratory	0	0	2	2	1
Total		**15**	**1**	**8**	**24**	**20**
A19MN6HS03	Gender Sensitization	0	0	2	2	0

L – Lecture T – Tutorial P – Practical D – Drawing

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

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

(A19BS1MT09) COMPLEX ANALYSIS AND TRANSFORMS

COURSE PRE-REQUISITES: Differentiation, Integration

COURSE OBJECTIVES:
- To know analytic functions and their properties
- To know concept of complex integration
- To know the notion of conformal mapping
- To know the properties of Fourier transforms
- To know classifications and method of solving Partial Differential Equations

COURSE OUTCOMES: After completion of the course, the student should 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, z2, 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. Complex Variables and Applications, J. W. Brown and R. V. Churchill, 7th Edition, McGraw-Hill, 2004
2. Higher Engineering Mathematics, B. S. Grewal, 36th Edition, Khanna Publishers, 2010
3. Higher Engineering Mathematics, B. V. Ramana, 11th Reprint, Tata McGraw-Hill, 2010

REFERENCES:

1. Advanced Engineering Mathematics, Peter O'Neil, 5th Edition, Cengage Learning, 2000
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**

(A19PC1EE01) 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 should be able to
CO-1: Analyze electric fields due to simple charge configurations
CO-2: Obtain magnetic fields and forces due to different configurations
CO-3: Analyze Maxwell's equation in different forms and media
CO-4: 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 D= ρV, 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 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 H=JC

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

REFERENCES:

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

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

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

(A19PC1EE02) 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 should be able to
CO-1: Identify the different parts and their role in electro-mechanical energy conversion operation of DC machines and transformers
CO-2: Select DC machines and Transformers for appropriate application
CO-3: Start and control the DC motor speed and transformer output voltage
CO-4: 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, 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: principle-Simple Loop generator, commutator action, construction, EMF equation, 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, compensating windings, 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: Principle, back EMF, Types of DC motors, Mechanical Power developed, Derivation of Torque equation, Operating characteristics of dc motors. Starting & Speed control of DC shunt motors, Losses and efficiency, condition for maximum efficiency, Swin-burne's test- Brake Test- Back-to back test- Field's Test

UNIT – V:

Transformers-I: Principle and construction of single-phase transformers, EMF equation, ideal transformer, 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, back-to-back test, All-Day efficiency

UNIT – VI:

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

TEXT BOOKS:

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

REFERENCES:

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

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

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

(A19PC1EC02) ELECTRONIC DEVICES AND CIRCUITS (Common to ECE, EIE & EEE)

COURSE PRE-REQUISITES: Engineering Physics (19BS1PH02)

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 should be able to
CO-1: Explain the principle 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 and its 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: 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 VBE, β and ICO, 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, C. Halkias, and Satyabrata Jit, 4th Edition, Tata McGraw Hill, 2015
2. Electronic Devices and Circuits, R. L. Boylestad and Louis Nashelsky, 11th Edition, Pearson/Prentice Hall, 2016

REFERENCES:

1. Integrated Electronics, J. Millman, C. Halkias, and Chetan D. Parikh, 2nd Edition, Tata McGraw Hill, 2010
2. Electronic Devices and Circuits, T. F. Bogart Jr., J. S. Beasley and G. Rico, 6th Edition, Pearson Education, 2004
3. Microelectronic Circuits, Adel S. Sedra and Kenneth C. Smith, 7th Edition, Oxford, 2014

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

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

(A19PC1EC03) DIGITAL SYSTEM DESIGN
(Common to EEE, ECE & EIE)

COURSE PRE-REQUISITE: Linear Algebra and Advanced Calculus (19BS1MT04)

COURSE OBJECTIVES:
- To understand and analyze 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 should 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

UNTI – 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 Circuits: 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, 3rd Edition, PHI, 2006
2. Modern digital Electronics, R. P. Jain, 4th Edition, Tata McGraw Hill, 2009
3. Digital Fundamentals, Floyd and Jain, 8th Edition, Pearson Education, 2009

REFERENCES:

1. Digital Systems, Ronald J Tocci, Neal S. Widmer, Gregory L Moss, 10th Edition, Pearson Education, 2009
2. Digital Principles and Applications, Donald P. Leach, Albert Paul Malvino and Goutam Saha, 8th Edition, McGraw Hill, 2014
3. Fundamentals of Logic Design, Charles H. Roth Larry L. Kinney, 7th Edition, Cengage, 2015

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

B.Tech. III Semester	**L**	**T/P/D**	**C**
	0	**3**	**1.5**

(A19PC2EE01) 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 should 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	**3**	**1.5**

(A19PC2EC01) ELECTRONIC DEVICES AND CIRCUITS LABORATORY (Common to ECE & EEE)

COURSE PRE-REQUISITES: Engineering Physics

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 should 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: Appreciate the effect of feedback on the systems' performance

Part A: (Only for viva-voce Examination)
ELECTRONIC WORKSHOP PRACTICE (in 2 lab sessions):
1. Identification, Specification, testing of R,L,C components (color codes),Potentiometer (SPDT, DPDT and DIP), Coils, Gang Condensers, Relays, Bread Board, PCB.
2. Identification, Specification, testing of Active devices: Diodes, BJT, Low power JFET, MOSFET, Power Transistors, LED, LCD, SCR, and UJT.
3. Study and operation of:
   a) Multimeters (Analog and Digital)
   b) Function Generator
   c) Regulated Power Supplies
   d) CRO

Part B:
1. V-I characteristics of PN junction diode under forward and reverse bias.
2. V-I characteristics of Zener diode and voltage regulator using Zener Diode.
3. Full wave Rectifier without filter and with π filter: Computation of Ripple factor and Regulation efficiency
4. Input and Output characteristics of CE transistor configuration: computation of h-parameters.
5. Input and Output characteristics of CB transistor configuration: computation of h-parameters.
6. Characteristics of FET under CS configuration.
7. Frequency response of CE Amplifier.
8. Frequency response of CS Amplifier.
9. Frequency response of Voltage series feedback amplifier.
10. RC phase shift Oscillator using transistors.
11. Colpitt's Oscillator using transistors.
12. Characteristics of UJT

Experiments over and above curriculum:
1. UJT Relaxation Oscillator.
2. Transistor as a switch.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

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

(A19PC2EC15) 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 should 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 AND TECHNOLOGY

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

(A19PC1EE03) 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 should 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-active - 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: Principle, Construction, Types, slip, rotor frequency, Torque equation, 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

UNIT – III:

Three Phase Induction Machines-II: Circle Diagram, 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, double field revolving Theory, Split-phase starting methods- Resistance and capacitor split phase motors, shaded pole motors, applications, single phase induction motor equivalent circuit-determination of machine parameters.

UNIT – V:

Synchronous Machines-I: Constructional features, types- cylindrical rotor synchronous machine - generated EMF, armature reaction, phasor diagram, synchronous

impedance, 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,

UNIT – VI:

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

TEXT BOOKS:

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

REFERENCES:

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

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

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

(A19PC1EE04) 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 should 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 components-Choice of site- advantages and Disadvantages.

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, Nominal- π Networks and A, B, C, D Constants - Numerical Problems. Long Transmission Line-Rigorous Solution, evaluation of A,B,C,D Constants, Representation of Long Lines - Equivalent-T and Equivalent- 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, Radio Interference - Problems.

UNIT – V:

Mechanical Design of Overhead Transmission Lines: 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.

UNIT – VI:

Distribution Systems:

Substations: Air Insulated and Gas Insulated Substations – Layouts - components – 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 -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, C. L. Wadhawa, New Age International (P) Limited, Publishers, 1997
2. Power System Analysis, John J. Grainger, William D. Stevenson, 4th Edition, TMC
3. Modern Power System Analysis, I. J. Nagrath and D. P. Kothari, 2nd Edition Tata McGraw-Hill Publishing Company

REFERENCES:

1. A Text Book on Power System Engineering, M. L. Soni, P. V. Gupta, U. S. Bhatnagar and A. Chakraborti, Dhanpat Rai and Co. Pvt. Ltd, 1999
2. Power System Analysis, Hadi Saadat, TMH Edition

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

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

(A19PC1EC06) ANALOG CIRCUITS
(Common to ECE & EEE)

COURSE PRE-REQUISITES: Electronic Devices and Circuits (19PC1EC02)

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 should be able to
CO-1: Analyze and Compute the parameters of single and multistage Amplifiers
CO-2: Design various large signal and tuned amplifiers
CO-3: Design the wave shaping circuit for a specified output
CO-4: Understand the characteristics of an Operational Amplifier
CO-5: Design various applications using linear integrated circuits

UNIT – I:

Frequency Response of BJT Amplifiers: Analysis at low and high frequencies, Effect of coupling and bypass capacitors, Miller's Theorem.
Transistor at High Frequency: 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, Frequency response and Analysis of multistage amplifiers, n-stage cascaded amplifier, 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:

Large Signal Amplifiers: Class-A Power Amplifier- Series fed and Transformer coupled, Conversion Efficiency, Class B Power Amplifier- Push Pull and Complimentary Symmetry configurations, Conversion Efficiency, Cross Over Distortion, Principle of operation of Class AB and Class C Amplifiers.
Tuned Amplifiers: Classification, Single Tuned Amplifiers – Q-factor, frequency response of tuned amplifiers, Concept of stagger tuning and synchronous tuning.

UNIT – IV:

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.

Non-Linear Wave Shaping: 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, and differential.

OP-AMP Applications: Basic applications 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.

555 Timer and PLL: Introduction to 555 timer, functional diagram, Mono-stable, Astable and Schmitt Trigger operations, PLL – operation and application.

TEXT BOOKS:

1. Integrated Electronics, J. Millman, C. Halkias and Chetan D. Parikh, 2nd Edition, Tata McGraw Hill, 2017
2. Pulse, Digital and Switching Waveforms, J. Millman, H. Taub and Suryaprakash Rao M., 3rd Edition, McGraw-Hill, 2017
3. Op-Amps and Linear Integrated Circuits, Ramakanth A. Gayakwad, 4th Edition, PHI, 2015

REFERENCES:

1. Electronic Circuit Analysis, S. Salivahanan, N. Suresh Kumar, 4th Edition, Tata McGraw-Hill Education, 2017
2. Pulse and Digital Circuits, K. Venkata Rao, K. Rama Sudha, G. Manmadha Rao, 1st Edition, Pearson Education India, 2010
3. Linear Integrated Circuits –D. Roy Choudhary, Shail B. Jain, 5th Edition, New Age International, 2018

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

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

(A19PC1ME18) FLUID MECHANICS AND HYDRAULIC MACHINES

COURSE PRE-REQUISITES: Mathematics, Physics and Engineering Mechanics

COURSE OBJECTIVES:

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

COURSE OUTCOMES: After completion of the course, the student should 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, 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, Yunus A. Çengel, John M. Cimbala, McGraw-Hill Higher Education, 2006
3. Fluid Mechanics and Hydraulic Machines, R. K. Bansal, Lakshmi Publications, 2005

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

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

(A19HS1MG02) ENGINEERING ECONOMICS AND ACCOUNTANCY

(Common to EEE, EIE, CSE and IT)

COURSE OBJECTIVES:

- To explain the basic nature of pure economics and to analyse certain concepts of both Micro & Macro Economics and to know the role of managerial economics in solving problems of business enterprises
- To understand different forms of organizing private-sector and public-sector business enterprises and problems which have been encountered by public enterprises in India
- To describe each stage of product life cycle with the help of different costs and their role in maintaining optimum cost of production and overall profitability by considering different market competitions
- To analyse the process involved in preparation of project proposals, to estimate capital required to commerce and carryon business projects, to know the various sources of mobilizing required amount of capital and to evaluate investment opportunities
- To apply the basic accounting concepts & conventions and to analyse financial position of business enterprise

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

CO-1: Perform decision making function effectively in an uncertain framework by applying the concepts of economics, manage demand efficiently and plan future course of action

CO-2: Select suitable form of business organization which meets the requirements of business

CO-3: Fix the right price which can best meet the pre-determined objectives of the business under different market conditions

CO-4: Identify the best source of mobilising capital, select most profitable investment opportunity, carry out & evaluate benefit/cost, life cycle and Break-even analysis on one or more economic alternatives

CO-5: Analyze overall position of the business enterprise, therefore, take appropriate measures to improve the situation.

UNIT – I:

Introduction to Economics & Managerial Economics: Introduction to Economics: Definition, nature, scope and types of Economics. Concepts of Macro-Economics: Gross Domestic Product (GDP), Gross National Product (GNP), National Income (NI) & Rate of Inflation.

Managerial Economics: Definition, nature, scope & significance.

Elements of Managerial Economics: Demand Analysis, Law of Demand, Elasticity of Demand and Demand Forecasting.

UNIT – II:

Forms of organizing Private and Public-Sector Business Enterprises:

Private Sector Business Enterprises:

(i) Sole Proprietorship - Definition, features, merits, limitations & suitability.

(ii) Partnership - Definition, Partnership Act, features, types, merits, limitations, suitability.

(iii) Joint-Stock Company - Definition, Companies Act, features, types, merits, limitations, suitability.

Public Sector Business Enterprises: Definition, features, objectives, merits, problems.

UNIT – III:

Market Structures, Product Life-Cycle (PLC), Pricing and Financial Accounting: Market Structures: Definition & common features of market and classifications of markets. Evaluation of market structures-Perfect Competition, Monopoly, Monopolistic Competition and Oligopoly.

Product Life-Cycle and Pricing: Definition, various stages of PLC, and Life-Cycle Costs; objectives and methods of pricing.

Introduction to Financial Accounting: Definition, basic principles and double-entry book- keeping, practice of accounting process-Journal, ledger, trial balance and final accounts (simple problems)

UNIT – IV:

Financial Analysis through Ratios: Meaning, computation of ratios

(i) Liquidity Ratios: Current Ratio and Quick Ratio,

(ii) Solvency Ratios: Interest Coverage Ratio and Debt- Equity Ratio,

(iii) Activity Ratios: Stock/Inventory Turnover Ratio and Debt Turnover Ratio,

(iv) Profitability Ratios: Gross Profit Ratio, Net Profit Ratio & Earning Per Share(EPS) Ratio.

UNIT – V:

Management Accounting: Definition & nature of Management Accounting.

Capital: Types of capital, factors influencing capital requirements, sources of mobilising Fixed and Working Capital.

UNIT – VI:

Cost Accounting: Cost Accounting: Definition, Types of costs – Opportunity cost, Explicit/Out-of-Pocket cost, Implicit/Imputed cost, Fixed cost, Variable cost, Semi-Variable cost, Differential cost, Sunk cost, Total cost, Average cost & Marginal cost. Break- Even/Cost-Volume-Profit (CVP) Analysis (Simple Problems).

TEXT BOOKS:

1. Managerial Economics and Financial Analysis, Aryasri, 2009; Tata McGraw-Hill
2. Managerial Economics, Varshney & Maheswari, 2009; Sultan Chand
3. Principles of Marketing: A South Asian Perspective, Kotler Philip, Gary Armstrong, Prafulla Y. Agnihotri and Eshan ul Haque, 2010, 13th Edition, Pearson Education/ Prentice Hall of India

REFERENCES:

1. Indian Economy, Misra S. K. and Puri, Himalaya Publishers
2. Textbook of Business Economics, Pareek Saroj, Sunrise Publishers
3. Financial Accounting for Management: An Analytical Perspective, Ambrish Gupta, Pearson Education
4. Managerial Economics, H. Craig Peterson & W. Cris Lewis; Prentice Hall of India

5. Guide to Proposal Writing, Jane C. Geever & Patricia McNeill, Foundation Centre

Website:
https://www.amazon.com/exec/obidos/tg/detail/-/0879547030/ref=ase_learnerassoci-20/102-4728473-7056968?v=glance&s=books

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B.Tech. IV Semester	**L**	**T/P/D**	**C**
	0	**3**	**1.5**

(A19PC2EE02) 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 should 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	**3**	**1.5**

(A19PC2EC05) ANALOG CIRCUITS LABORATORY

COURSE PRE-REQUISITES: Electronic Devices and Circuits

COURSE OBJECTIVES:
- To explain the operation, design and Analysis of multistage amplifiers using BJT
- To understand the operation of power amplifiers and their efficiency
- To understand the operation of wave shaping circuits
- 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 should be able to
CO-1: Design and analyze multi-stage amplifier circuits
CO-2: Design Linear and Non-linear waveshaping circuits
CO-3: Analyze and design application specific circuits using Op.Amp IC 741
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. Common Emitter Amplifier
2. MOSFET- CS amplifier
3. Two stage RC coupled BJT Amplifier
4. Darlington amplifier.
5. Class B Complementary Symmetry Amplifier.

PART – B: Implement the following

1. Linear Waves shaping - RC high pass and low Pass circuits
2. Non-linear wave shaping–Clippers
3. Non-linear wave shaping–Clampers
4. Adder, Subtractor, Comparator, Integrator and Differentiator using IC 741 OP-AMP.
5. Square Wave Generator and Triangular Wave Generator using OP- AMP.
6. R-2R ladder D-A Converter
7. Monostable and Astable Multivibrator.using 555 timer
8. Schmitt Trigger circuits using IC 741 & IC 555.

Experiments over and above the curriculum:
1. Sweep generator
2. Active first order LPF, HPF using OP-AMP

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

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

(A19PC2IT02) PYTHON PROGRAMMING LABORATORY

COURSE OBJECTIVES:
- To install and run the Python interpreter
- To learn control structures
- To understand Lists, Dictionaries in python
- To handle Strings and Files in Python

COURSE OUTCOMES: After completion of the course, the student should be able to
CO-1: Develop the application specific codes using python
CO-2: Understand Strings, Lists, Tuples and Dictionaries in Python
CO-3: Verify programs using modular approach, file I/O, Python standard library
CO-4: Implement Digital Systems using Python

EXERCISE 1: Basics
Running instructions in Interactive interpreter and a Python Script
Write a program to purposefully raise Indentation Error and correct it

EXERCISE 2: Operations
Write a program to compute GCD of two numbers by taking input from the user
Write a program add.py that takes 2 numbers as command line arguments and prints its sum.

EXERCISE 3: Control Flow
Write a Program for checking whether the given number is even number or not.
Write a program using for loop that loops over a sequence.
Python Program to Print the Fibonacci sequence using while loop
Python program to print all prime numbers in a given interval (use break)

EXERCISE 4: Lists
Find mean, median, mode for the given set of numbers in a list.
Write a program to convert a list and tuple into arrays.
Write a program to find common values between two arrays.

EXERCISE 5: Dictionary
Write a program to count the numbers of characters in the string and store them in a dictionary data structure
Write a program combine_lists into a dictionary.

EXERCISE 6: Strings
Write a program to check whether a string starts with specified characters.
Write a program to check whether a string is palindrome or not

EXERCISE 7: Strings Continued
Python program to split and join a string
Python Program to Sort Words in Alphabetic Order

EXERCISE 8: Files
Write a program to print each line of a file in reverse order.
Write a program to compute the number of characters, words and lines in a file.
Write a program to count frequency of characters in a given file.

EXERCISE 9: Functions
Simple Calculator program by making use of functions
Find the factorial of a number using recursion
Write a function dups to find all duplicates in the list.
Write a function unique to find all the unique elements of a list.

EXERCISE 10: Functions - Problem Solving
Write a function cumulative_ product to compute cumulative product of a list of numbers.
Write a function reverse to print the given list in the reverse order.
Write function to compute GCD, LCM of two numbers

EXERCISE 11: Multi-D Lists
Write a program that defines a matrix and prints
Write a program to perform addition of two square matrices
Write a program to perform multiplication of two square matrices

EXERCISE 12: Modules
a) Install NumPypackage with pip and explore it.

EXERCISE 13:
Write a program to implement Digital Logic Gates – AND, OR, NOT, EX-OR
Write a program to implement Half Adder, Full Adder, and Parallel Adder

TEXT BOOKS:
1. Python Programming: A Modern Approach, Vamsi Kurama, Pearson
2. Learning Python, Mark Lutz, Orielly

REFERENCES:
1. Think Python, Allen Downey, Green Tea Press
2. Core Python Programming, W. Chun, Pearson
3. Introduction to Python, Kenneth A. Lambert, Cengage

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

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

(A19MN6HS03) 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 should 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. "More than One Million Women are Missing" by Sen, Amartya, 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. "By the Numbers: Where Indian Women Work" Women's Studies Journal (14 November 2012), Tripti Lahiri, Available online at: http: // blogs.wsj.com/ India real time/2012/11/14/by-the-numbers-where-India-women-work/&gt
3. "I Fought For My Life ...and Won " by Abdulali Sohaila, Available online at: http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulal
4. The Violence of Development: The Politics of Identity, Gender and Social Inequalities in India, K. Kapadia, London: Zed Books, 2002
5. Just Development: Beyond Adjustment with a Human Face, T. Banuri and M. Mahmood, Karachi: Oxford University Press, 1997