PROGRAM STRUCTURE AND DETAILED SYLLABUS

II B. TECH – I SEM (VR 20)

EEE

II Year – I Semester

S. No	Course Code	Name of the Course	L	T	P	Credits
1.	1002202100	Fundamentals of signals and systems	3	1	0	3
2.	1002202101	Electrical Machines-I	3	0	0	3
3.	1002202102	Electro Magnetic Fields	3	1	0	3
4.	1004202103	Semiconductor Devices and Circuits	3	0	0	3
5.	1002202103	Electrical Circuit Analysis-II	3	1	0	3
6.	1002202110	Electrical Machines-I lab	0	0	3	1.5
7.	1004202112	Semiconductor Devices and Circuits lab	0	0	3	1.5
8.	1020202100	Employability Readiness Program	1	0	2	2
9.	1000202120	Life Skills	2	0	0	0
		Total Credits:				**20**

II Year – I Semester	Fundamentals of Signals and Systems	L	T	P	Credits
1002202100		3	1	0	3

Course Overview:

This course deals with basic types of signals and systems and their analysis in time domain and frequency domain.

Course Objectives:

- Characterize the signals and systems and Concept of orthogonality.
- Analyze the continuous-time signals and continuous-time systems using Fourier series, Fourier transform and Laplace transform.
- Apply sampling theorem to convert continuous-time signals to discrete-time signal and reconstruct back.
- Understand the relationships among the various representations of LTI systems
- Understand the Concepts of convolution, correlation
- Apply z-transform to analyze discrete-time signals and systems.

Course Outcomes: After completion of the course, students are able to:

1. Distinguish between various types of signals and systems.
2. Understand the conversion of continuous time signals to discrete time signals and vice versa.
3. Analyze continuous time LTI systems
4. Analyze discrete time LTI systems

Unit-I:

INTRODUCTION: Definition of Signals and Systems, Classification of Signals, Classification of Systems, Operations on signals: time-shifting, time-scaling, amplitude-shifting, amplitude-scaling. Impulse response, Transfer function of a LTI system. Complex exponential and sinusoidal signals, Singularity functions and related functions: impulse function, step function signum function and ramp function. Condition for Orthogonality

UNIT –II:

FOURIER SERIES AND FOURIER TRANSFORM: Fourier series representation of continuous time periodic signals (without derivations), properties of Fourier series (without proofs), Dirichlet's conditions, Trigonometric Fourier series and Exponential Fourier series (without derivations), Complex Fourier spectrum. Application of Fourier series analysis to simple electric circuits. Deriving Fourier transform from Fourier series, Fourier transform of arbitrary signal, Fourier transform of standard signals, Fourier transform of periodic signals, properties of Fourier transforms (without proofs), Fourier transforms involving impulse function and Signum function. Introduction to Hilbert Transform. Parseval's theorem

UNIT –III:

SAMPLING THEOREM & ANALYSIS OF LINEAR SYSTEMS: Graphical and analytical proof for Band Limited Signals, impulse sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, effect of under sampling – Aliasing.

Concept of convolution in time domain and frequency domain, Graphical representation of convolution. Filter characteristics of linear systems. Signal bandwidth, system bandwidth, Ideal LPF, HPF and BPF characteristics relationship between bandwidth and rise time. Cross-correlation and auto-correlation of functions. Properties of correlation function. Relation between convolution and correlation

UNIT –IV:

Analysis of continuous time systems: Review of Laplace transforms,Inverse Laplace transform, Concept of region of convergence (ROC) for Laplace transforms, constraints on ROC for various classes of signals, Properties of LT(without proofs), Relation between L.T's, and F.T. of a signal. Laplace transform of certain signals using waveform synthesis, Analysis and characterization of continuous LTI systems using LT.

UNIT –V

Analysis of Discrete time systems: Discrete time signal representation- using complex exponential and sinusoidal, Periodicity of discrete time signals, properties of Z-transforms (without proofs), Z- Transforms of a discrete sequence. Distinction between Laplace, Fourier and Z transforms. Region of convergence in Z-Transform, constraints on ROC for various classes of signals, Inverse Z-transform, Analysis and characterization of discrete LTI systems using ZT.

Text Books:

1. Signals, Systems & Communications - B.P. Lathi, BS Publications, 2003.
2. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, PHI, 2nd Edn.
3. Signals & Systems- Narayan Iyer and K Satya Prasad, Cenage Pub.

Reference Books:

1. Signals & Systems - Simon Haykin and Van Veen, Wiley, 2nd Edition.
2. Principles of Linear Systems and Signals – BP Lathi, Oxford University Press, 2015
3. Signals and Systems – K Raja Rajeswari, B Visweswara Rao, PHI, 2009
4. Fundamentals of Signals and Systems- Michel J. Robert, MGH International Edition, 2008.
5. Signals and Systems – T K Rawat , Oxford University press, 2011

II Year – I Sem		L	T	P	C
1002202101	**Electrical Machines-I**	3	0	0	3

COURSE OBJECTIVES:

1. To analyse the construction of DC generators, DC motors and transformers.
2. To elaborate the characteristics, methods of speed control and testing methods of DC machines and transformers
3. To predetermine the performance of single phase transformers with equivalent circuits and also find regulation and efficiency.
4. To describe poly-phase transformers and auto transformers and achieve three phase to two phase conversion.

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Describe the construction and operation of a DC Machines, Starters, single phase and poly-phase transformers and auto-transformers.	1,2,9,10,11, 12	3,3,2,2,2,1
CO2	Analysesof the performance of DC machines and transformers.	1,2,9,10,11, 12	3,3,2,2,2,1
CO3	Discuss the speed control methods of dc motors, working of starters and losses in DC machines and transformers.	1,2,9,10,11, 12	3,3,2,2,2,1
CO4	Calculate efficiency of DC machines and transformers and also achieve three phase to two phase conversion in poly-phase transformers	1,2,9,10,11, 12	3,3,2,2,2,1

UNIT 1

INTRODUCTION TO DC MACHINES: [8]

Construction and principle of operation of DC generator – Armature Windings-EMF equation for generator – Classification of DC machines based on excitation – OCC and External characteristics of DC shunt generator. Armature reaction and commutation– DC motor- principle of operation-Torque and back-emf equation of DC motors.

UNIT 2

PERFORMANCE AND TESTING OF D.C. MACHINES: [8]

Characteristics of separately-excited and self excited motors (shunt, series and compound) - losses and efficiency- applications of dc motors. Necessity of starter – Starting by 3 point and 4 point starters – Speed control by armature rheostat and field control – Testing of DC machines - brake test, Swinburne's method –- retardation test .

UNIT-III

SINGLE-PHASE TRANSFORMERS: [8]

Types and constructional details - principle of operation - EMF equation - operation on no load and operation on load –phasor diagrams on load and no load– equivalent circuit(Exact and approximate) – regulation – losses and efficiency-All day efficiency

UNIT-IV

SINGLE-PHASE TRANSFORMERS TESTING: [8]

Tests on single phase transformers – open circuit and short circuit tests – Sumpner's test – separation of losses- effect of variation of frequency and supply voltage on losses -parallel operation with equal voltage ratios and problems

UNIT–V

AUTO TRANSFORMERS AND 3-PHASE TRANSFORMERS: [8]

Basic principle of operation of Auto transformers, Construction of 3-PhaseTransformers-Connections Y/Y, Y/Δ, Δ/Y, Δ/Δ and open Δ-Third harmonics in phase voltages– On load and off load tap changers -Scott connection

Text Books:

1. Electrical Machines – P.S. Bhimbra, Khanna Publishers,7th edition
2. Electrical Machines by R.K.Rajput, Lakshmi publications,5th edition

Reference Books:

1. Electrical Machines by D. P.Kothari, I .J .Nagarth, Mc Graw Hill Publications, 4th edition
2. Electric Machinery by A.E.Fitzgerald, Charles Kingsley, Stephen D.Umans, TMH
3. Electrical Machinery by Abijith Chakrabarthi and Sudhipta Debnath, McGraw Hill education 2015
4. Electrical Machinery Fundamentals by Stephen J Chapman McGraw Hill education 2010
5. Electric Machines by Mulukutla S. Sarma & Mukeshk. Pathak, CENGAGE Learning.
6. Theory & Performance of Electrical Machines by J.B.Guptha. S.K.Kataria& Sons

NPTEL/MOOC:

1. https://nptel.ac.in/courses/108/105/108105017/

II Year – I Semester		L	T	P	C
1002202102	**Electro Magnetic Fields**	3	1	0	3

COURSE OBJECTIVES:

- To study the production of electric field due to different charge configurations and to understand the application of Gauss Law.
- To study the production of magnetic field due to different current configurations, and to understand the application of Ampere's law.
- To understand the behaviour of materials in Electric Field and to study the magnetic force.
- To do inductance and capacitance calculations.
- To study Maxwell's equations and Poynting vector .

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Calculate electric field from various charge distributions and find magnetic field from various current distributions.	PO-1 PO-2 PO-4 PO-5 PO-9 PO-10 PO-12	3 3 3 2 1 1 3
CO2	Understand polarization in dielectrics, electric current density, and resistance of conductors and also Calculate force in electric and magnetic fields and torque in magnetic fields.	PO-1 PO-2 PO-3 PO-9 PO-10 PO-12	3 3 2 1 1 3
CO3	Determine inductance, capacitance of different physical configurations.	PO-1 PO-2 PO-3 PO-9 PO-10 PO-12	3 1 2 1 1 3
CO4	Apply Faraday's Law to calculate induced Emf and understand Maxwells equations, Poynting theorem and vector.	PO-1 PO-2 PO-3 PO-6 PO-12	3 3 2 2 3

**Strength of mapping (Intensity Scale) – 1(Lightly mapped), 2(Moderately mapped), 3(Heavily mapped)

UNIT- I

ELECTROSTATIC FIELDS: [9 Hours]

Review of Vector calculus, coordinate systems, Coulomb's Law – Electric Field Intensity (EFI)- EFI due to a finite and infinite line charges- Gauss's law & applications-Work done in moving a point charge in an Electrostatic field- Electric Potential & Potential gradient - Laplace's and

Poison's equations. Electric dipole – Dipole moment – potential and EFI due to an electric dipole- Torque on an Electric dipole.

UNIT-II

STATIC MAGNETIC FIELDS: [8 Hours]

Biot-Savart's law & *Oersted's E*xperiment-Magnetic field intensity (MFI) magnetic flux density- MFI due to a straight current carrying filament- Ampere's circuital law -Point form of Ampere's circuital law- Applications of Amperes law viz. MFI due to an infinite sheet of current, a long filament carrying conductor, solenoid current a circular loop, rectangular loop- Magnetic Levitation principles.

UNIT-III

MATERIALS IN ELECTRIC FIELD [9 Hours]

Dielectrics- polarization- Behavior of Conductors and Insulators-Boundary conditions- Conduction and Convection current densities-Ohm's law in point form, Equation of continuity.

MAGNETIC FORCE

Lorentz force equation – Force on a current element in a magnetic field- Force on a straight and a long current carrying conductor in a magnetic field- Force between two straight long and parallel current carrying conductors - Torque on a current loop placed in a magnetic field- Application of Electromagnetic meta Materials.

UNIT-IV

CAPACITANCE CALCULATIONS [8 Hours]

Energy stored and energy density in a static electric field- Capacitance & capacitance of parallel plates with composite dielectrics -capacitance of spherical and coaxial cables.

INDUCTANCE CALCULATIONS

Energy stored and density in a magnetic field-Self and Mutual inductance -determination of self-inductance of a solenoid and toroid.

UNIT-V

TIME VARYING FIELDS [8 Hours]

Faraday's laws of electromagnetic induction Its integral and point forms -Maxwell's fourth equation, Curl (E)=-∂B/∂t- Statically and Dynamically induced EMFs, Simple problems –

Modification of Maxwell's equations for time varying fields- Displacement current- Poynting Theorem and Poynting Vector.

Text Books:

1. William H Hayt and Jr John A Buck, "Engineering Electromagnetics", 6thEdition,Tata McGraw-Hill Publishing Company Ltd, New Delhi, 2008.
2. Principles of Electro Magnetics by Matthew N.O.Sadiku, Oxford Publications,4th edition

Reference Books:

1. Introduction to Electro Dynamics by D J Griffiths, Prentice-Hall of India Pvt.Ltd, 2nd edition
2. Electromagnetic Field Theory by Yaduvir Singh, Pearson
3. Fundamentals of Engineering Electromagnetics by Sunil Bhooshan,Oxford higher Education.

E-Books:

1. http://scipp.ucsc.edu/~haber/ph214/EMFT_Book_Thide.pdf
2. https://civildatas.com/download/elements-of-electromagnetics-by-matthew-sadiku

NPTEL/MOOC:

1. https://nptel.ac.in/courses/108/106/108106073/

II Year – I Semester	Semi-Conductor Devices and Circuits	L	T	P	C
1004202103		3	0	0	3

COURSE OBJECTIVES:

1. To study the construction details, operation and characteristics of junction diode and application of diodes
2. To learn biasing stabilization and compensation methods and to analyze transistor amplifiers..
3. To understand the concepts of positive and negative feedbacks and their role in amplifiers and oscillators.
4. To understand the basic operation of differential amplifiers and learn the linear and non-linear applications of operational amplifiers

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Distinguish the characteristics of different diodes and choose appropriate diode for an application based on the operation	PO1 PO2 PO3 PO12	2
CO2	Design different biasing and stabilization circuits and apply compensation techniques for a transistor.	PO1 PO2 PO3 PO12	2
CO3	Analyse the merits and demerits of positive and negative feedback and the role of feedback in oscillators and amplifiers.	PO1 PO2 PO3 PO4 PO12	2
CO4	Design circuits using operational amplifier for various applications.	PO-1 PO-2 PO-3 PO-4 P12	2

**Strength of mapping (Intensity Scale) – 1(Lightly mapped), 2(Moderately mapped), 3(Heavily mapped)

UNIT- I

DIODE AND ITS APPLICATIONS [12 Hours]

PN Junction Diode – Formation Of Junction, Junction Capacitance, Characteristics, Diode Equations.

Diode Application Circuits :Rectifiers- Halfwave, Fullwave centre tapped and Bridge rectifiers. Filters-capacitor filter, inductor filter

Special Diodes : Zener Diode, Varactor Diode, LED.

UNIT-II

TRANSISTOR COFIGURATION **[** 10 Hours]

BJT Configurations and Characteristics, current gains, DC analysis and biasing of BJTs. Transistors acts as switch and amplifier.

FET Configuration and Characteristics: JFET and MOSFET.

UNIT-III

SMALL SIGNAL TRANSISTOR AMPLIFIERS **[** 12 Hours]

Transistor hybrid model, determination of h-parameters, generalized analysis of transistor amplifier model using h-parameters, Analysis of CB, CE and CC amplifiers using Simplified h-parameters

UNIT-IV

FEEDBACK AMPLIFIER [10 Hours]

Basic concepts of feedback-Negative feedback advantages and Classification. Voltage/Current Series/Shunt, Positive feedback, effect of feedback on input and output resistances.

Oscillators – barkhausen criteria, RC phase shift oscillator and wein bridge oscillators Using BJT and FET.

UNIT-V

CHARACTERISTICS & APPLICATIONS OP-AMP **[1**2 Hours]

CHARACTERISTICS:

Block Diagram of Op-amp, Characteristics of ideal and practical Op-amp, Op-Amp parameters: Input & Output off set voltages & currents, Input bias current, slew rate, CMRR, PSRR, drift, Pin diagram of IC-741.

APPLICATIONS :

Linear applications of op-amp – summing, subtracting, averaging amplifier, differentiator and integrator, Instrumentation Amplifier.

Nonlinear applications of op-amp – Comparator, Square wave generator, Triangular wave generator.

Text Books:

1. S.Salivahanan, N.Sureshkumar. “Electronic Devices &Circuits , TATA McGraw Hill 2nd ed”(2011)
2. Millman, Jacob, and Cristos C. Halkias. "Satyabrata Jit; Electronic Devices and Circuits." TATA McGraw Hill 2nd ed”(2011).
3. Op-Amps & Linear ICs - Ramakanth A. Gayakwad, PHI, 1987.

Reference Books:

1. Boylestad, Robert L., and Louis Nashelsky. "Electronic Devices and Circuit Theory Pearson/Prentice Hall, 9thEdition, 2006

2. Linear Integrated Circuits – D. Roy Choudhury, New Age International (p) Ltd, 2nd Edition,2003.

NPTEL/MOOC:

1. https://www.youtube.com/watch?v=9g9dowLjmCA&list=PLp6ek2hDcoNDAw1BehPFazZ5ogPV8UlQa
2. https://www.youtube.com/watch?v=pkIxCmaxWFg&list=PLbRMhDVUMngehqNF2w_UbAi94qIycZOTG

II Year – I Semester		L	T	P	C
1002202103	Electrical Circuit Analysis-II	3	1	0	3

COURSE OBJECTIVES:

- To study the concepts of balanced three-phase circuits and its power measurement.
- to study the concepts unbalanced three-phase circuits and network graph theory
- To study the transient behavior of electrical networks with DC, pulse and AC excitations.
- To study the performance of a network based on input and output excitation/response
- To understand the realization of electrical network function into electrical equivalent passive elements.

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Analyze the three phase circuits under balanced and unbalanced condition.	1, 2, 4, 6, 7, 9, 10, 12	3, 3, 3, 3, 2, 3, 2, 3
CO2	Analyze the resonance condition for different circuits and acquire the knowledge of graph theory	1, 2, 4, 6, 7, 9, 10, 12	3, 3, 3, 3, 2, 3, 2, 3
CO3	Analyze the transient behaviour of the electrical circuits for different types excitations.	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12	3, 3, 3, 3, 2, 3, 2, 3, 3, 3,3,2
CO4	Find parameters for different types of networks and realize electrical equivalent network for a given network transfer function.	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12	3, 3, 3, 3, 2, 3, 2, 3, 3, 3,3,2

UNIT- I

THREE PHASE CIRCUITS: [8 Hours]

Phase sequence, star and delta connection of sources and loads, relation between line and phase voltages and currents. Analysis of three phase balanced and unbalanced circuits. Loop method, Star-Delta transformation technique, measurement of active and reactive power.

UNIT-II

RESONANCE: [8 Hours]

Series and Parallel Resonance, Different combinations, Quality factor, Bandwidth, Selectivity.

INTRODUCTION TO GRAPH THEORY (ELEMENTARY TREATMENT ONLY)

Basic definitions, Incidence matrix, basic tie set matrix, basic cutest matrix.

UNIT-III

TRANSIENT ANALYSIS IN DC AND AC CIRCUITS: [8 Hours]

Transient response of R-L, R-C, R-L-C circuits for DC and AC excitations, Solution using Laplace transforms.

UNIT-IV

TWO PORT NETWORKS: [8 Hours]

Two port network parameters -Z, Y, ABCD and Hybrid parameters and their relations, Interconnected networks.

UNIT-V

NETWORK SYNTHESIS: [8 Hours]

Positive real function - basic synthesis procedure - LC immittance functions - RC impedance functions and RL admittance function - RL impedance function and RC admittance function - Foster and Cauer methods.

Text Books:

1. Engineering Circuit Analysis by William Hayt and Jack E.Kemmerley,McGraw Hill Company, 8th edition
2. Network synthesis: Van Valkenburg; Prentice-Hall of India Private Ltd
3. Fundamentals of Electrical Circuits by Charles K.Alexander and Mathew N.O.Sadiku, McGraw Hill Education (India), 6th edition.
4. Network Theory Analysis and Synthesis by SmarajitGhosh, PHI publications

Reference Books:

1. Introduction to circuit analysis and design by TildonGlisson. Jr, Springer Publications.
2. Circuits by A. Bruce Carlson , Cengage Learning Publications
3. Networks and Systems by D. Roy Choudhury, New Age International publishers
4. Electric Circuits by David A. Bell, Oxford publications
   Circuit Theory (Analysis and Synthesis) by A.Chakrabarthi,DhanpatRai&Co.

E-Books:

1. https://www.electronicbo.com/p/wating.html??&&url=_http://bit.ly/2KKtD71
2. https://bookboon.com/en/concepts-in-electric-circuits-ebook
3. https://open.umn.edu/opentextbooks/textbooks/dc-electrical-circuit-analysis-a-practical-approach-fiore
4. https://open.umn.edu/opentextbooks/textbooks/ac-electrical-circuit-analysis-a-practical-approach-fiore

NPTEL/MOOC:

1. https://nptel.ac.in/courses/108/104/108104139/

II Year – I Semester	Electrical Machines-I Lab	L	T	P	C
1002202110		0	0	3	1.5

COURSE OBJECTIVES:

1. To plot the magnetizing characteristics of DC shunt generator and understand the mechanism of self-excitation.
2. To control the speed of the DC motors.
3. Determine and predetermine the performance of DC machines.
4. To predetermine the efficiency and regulation of transformers and assess their performance.

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	To determine and predetermine the performance of DC machines	1, 2, 3, 9,10	3,3,2,2,2
CO2	To control the speed of DC motor	1, 2, 3, 9,10	3,3,2,2,2
CO3	To achieve three phase to two phase transformation	1, 2, 9,10	3,3,2,2
CO4	To determine and predetermine the performance of 1-phase Transformers 1-phase Transformers	1,2,3,9,10	3,3,2,2,2

LIST OF EXPERIMENTS

S.No.	Name of the experiment	Skill
1	Magnetization characteristics of DC shunt generator. Determination of critical field resistance and critical speed.	Understanding , Calculation
2	Brake test on DC shunt motor. Determination of performance curves.	Calculation , Analysis
3	Swinburne's test and Predetermination of efficiencies as Generator and Motor.	Calculation , Analysis
4	Speed control of DC shunt motor by Field and armature Control.	Comparison, ,Analysis
5	Retardation test on DC shunt motor. Determination of losses at rated speed.	Calculation
6	OC & SC test on single phase transformer.	Calculation, Analysis
7	Sumpner's test on single phase transformer.	Calculation, Analysis
8	Scott connection of transformers	Understanding
9	Parallel operation of Single phase Transformers	Understanding
10	Separation of core losses of a single phase transformer	Understanding, calculation

Text Books:

1. Electrical Machines – P.S. Bhimbra, Khanna Publishers , 7th edition
2. Electrical Machines by R.K.Rajput, Lakshmi publications,5th edition

Reference Books:

1. Electrical Machines by D. P.Kothari, I .J .Nagarth, McGraw Hill Publications, 4th edition
2. Electric Machinery by A.E.Fitzgerald, Charleskingsley, Stephen D.Umans, TMH
3. Electrical Machinery by Abijith Chakrabarthi and Sudhipta Debnath, McGraw Hill education 2015
4. Electrical Machinery Fundamentals by Stephen J Chapman McGraw Hill education 2010

II Year – I Semester	Semi-Conductor Devices and Circuits Lab	L	T	P	C
1004202112		0	0	3	1.5

COURSE OBJECTIVES:

1. To understand the operation and characteristics of junction diode and application of diodes, Special diode and FET
2. To learn operation and characteristics ofTransistor CE Characteristics
3. To understand the concepts of Voltage Series Amplifier and RC Phase Shift Oscillator.
4. To understand the Characteristics of op-amp and Applications of op-amp

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Distinguish the characteristics of different diodes and choose appropriate diode for an application based on the operation	PO1 PO2 PO3 PO12	2
CO2	learn operation and characteristics ofTransistor CE Characteristics	PO1 PO2 PO3 PO12	2
CO3	Analyze the concepts of Voltage Series Amplifier and RC Phase Shift Oscillator	PO1 PO2 PO3 PO4 PO12	2
CO4	Design circuits using operational amplifiers for various applications.	PO-1 PO-2 PO-3 PO-4 P12	2

**Strength of mapping (Intensity Scale) – 1(Lightly mapped), 2(Moderately mapped), 3(Heavily mapped)

LIST OF EXPERIMENTS

S.No.	Name of the experiment	Skill
1	PN Junction Diode V-I Characteristics	Observe & Verify the V-I characteristics of P-N junction diode.
2	Zener Diode V-I Characteristics	Observe & Verify the V-I characteristics of Zener diode.
3	Half WaveRectifier Without and With Filter	Verify HWR output with and without filter.
4.	Full wave Rectifier Without and With Filter	Verify FWR outputwith and without filter.

5.	Transistor CE Characteristics (Input & Output).	Observe & Verify the CE Characteristics.
6	JFET Characteristics	Observe &Verify the FET Characteristics.
7	Frequency response of CE Amplifier.	Observe &Determine gain, bandwidth
8	Voltage Series Feedback Amplifier	Observe & Determine gain, bandwidth
9	RC Phase Shift Oscillator.	Observe & Determine frequency.
10	Op-amp Applications: adders , Subtractors and Comparators	Verify the output for different input conditions.
11	Op-amp Applications: Integrators and Differentiators.	Verify the output for different input conditions.
12	Function generator using IC741	Design & verify for a given frequency.

Text Books:

1 S.Salivahanan,N.Sureshkumar. “Electronic Devices &Circuits , TATA McGraw Hill 2nd ed”(2011)
2. Millman, Jacob, and Cristos C. Halkias. "Satyabrata Jit; Electronic Devices and Circuits." TATA McGraw Hill 2nd ed”(2011).
3. Op-Amps & Linear ICs - Ramakanth A. Gayakwad, PHI, 1987.

Reference Books:

1.Boylestad, Robert L., and Louis Nashelsky. "Electronic Devices and Circuit Theory Pearson/Prentice Hall, 9thEdition, 2006

2. Linear Integrated Circuits – D. Roy Choudhury, New Age International (p) Ltd, 2nd

Edition,2003

II Year	Skill Oriented Course	L	T	P	C
1020202100	Employability Readiness Program	1	0	2	2

COURSE OBJECTIVES

1. To enhance the problem solving skills in the area of 'Quantitative Aptitude' this will enable the students to achieve in-campus placements and competitive examinations.
2. To improve the logical thinking capability of students by enhancing the skills in Reasoning.
3. To encourage the all-round development of students by focusing on verbal ability.
4. To perform better during Campus Recruitment and various interviews they face in their career.

COURSE OUTCOMES

CO	At the end of the course, the student will have the ability to:	Strength of Mapping	POs Mapped
CO1	Follow strategies in minimizing time consumption in problem solving and apply shortcut methods to solve problems and confidently solve any mathematical problems and utilize these mathematical skills both in their professional as well as personal life.	Understanding and Applying (L2&L3)	PO-1 PO-2 PO-12
CO2	Apply various methods of solving a problem by analysing the concept and situation effectively.	Understanding and Applying (L2&L3)	PO-1 PO-2 PO-12
CO3	Communicate effectively with improved vocabulary and able to write e-mails, essays and resumes appropriately.	Understanding (L2)	PO-10 PO-12
CO4	Succeed in professional and personal life by applying all mathematical, reasoning and verbal skills.	Understanding and Applying (L2&L3)	PO-1 PO-2 PO-10 PO-12

Part-A **No. of lecture hours: 25**

Aptitude

Number System: Speed Maths, Numbers, Factors, Prime & Co-Primes, LCM, HCF, Divisibility rules, finding unit place digit and last two digits of an expression.

Averages and Ages: Average of different groups, change in averages by adding, deleting and replacement of objects, problems on ages.

Ratio, Proportion and Variations: Definition of Ratio, Ratio of Proportion, Comparison of ratios, Compound ratio, Direct and indirect proportion.

Allegation and mixtures: Allegation rule, Mean value of the mixture, Replacement of equal amount of quantity.

Percentages: Converting fractions and decimal into percentages, successive percentage, populations, expenditure and savings

Time and Work: Men and Days, Work and Wages, Hours and Work, Alternate days concept.

Time and Distance: Difference between the average and relative speeds, reaching the destination late and early, Stoppage time per hour, time and distance between two moving bodies.

Trains, Boats and Streams: Train crossing man, same and opposite directions, Speed of boat and stream.

Profit and loss: Relation between Cost price and Selling price, Discount and Marked price, Gain or Loss percentages on selling price

Simple and Compound Interest: Problems on Interest (I), Amount (A), Principal (P) and Rate of

Interest(R), Difference between the simple interest and compound interest for 2 and 3 years.

Permutation and Combination: Fundamental rules, problems on permutations & combinations.

Outcome:

1. Apply shortcut methods to solve mathematical problems.

2. Follow strategies in minimizing time consumption in problem solving and to perform well in various competitive exams and placement drives.

3. Solve various Basic Mathematics problems by following different methods

4. Solve any mathematical problems and utilize these mathematical skills both in their professional as well as personal life.

Logical Reasoning

Blood Relations: Defining the various relations among the members of a family, Solving Blood Relation Puzzles by using symbols and notations. Problems on Coded relations.

Series completion: Number series, Alphabet series, and Letter series.

Coding and Decoding: Letter coding, Number coding, Number to letter coding, Matrix coding, Substitution, Mixed letter coding, Mixed number coding, deciphering individual letter codes by analysis.

Direction sense test: Sort of directions in puzzles distance between two points, problems on shadows, Application of triangular triplets.

Clocks: Relation between minute-hour hands, angle vs. time, exceptional cases in clocks

Calendars: Definition of a Leap Year, Finding the odd days, finding the day of any random calendar date, repetition of calendar years.

Outcome:

1. Solve various Basic Mathematics problems by following different methods and analyses.

2. Follow strategies in minimizing time consumption in problem solving

3. Apply shortcut methods to solve problems and confidently solve any mathematical problems

Part-B **No. of lecture hours: 25**

Verbal: Competitive Grammar: Verb-Tenses, Adjectives & Adverb, Preposition, Conjunction, Syntax (Activity based learning).

Word Etymology, One word substitutes, Word games – Vocabulary development.

Reading Comprehension: General Strategies for Reading Comprehension: Narrative Text, Strategies for Reading Comprehension: Expository Text, Main Idea/Summarization

Sentence Correction/ Improvement/ Completion, Subject-verb agreement, Repetition, Error in modifiers.

Direct-Indirect Speech, Active Passive Voice, Cloze Test

Outcome:

1. Understand the vocabulary.
2. Understand the core competencies to succeed in professional and personal life.
3. Students have the adequate writing skills that are needed in an organization.

Text Books:

1. Quantitative Aptitude by R S Agarwal, S Chand Publications

2. Quantitative Analysis. Third edition (Hall, William Thomas). Norris F. Hall · Cite this: J. Chem. Educ. 1942, 19, 7, 350.

3. A Modern Approach to Verbal Reasoning by R S Agarwal, S.Chand Publications.

4. Arun Sharma and Meenakshi Upadhyay for verbal ability

Reference Books:

1. Quantitative Aptitude – Abhijit Guha, McGraw Hills.

2. Logical Reasoning, Arun Sharma, McGraw Hill.

3. Analytical & Logical Reasoning, Peeyush Bhardwaj, Arihant Publications

4. Mc Graw Hill Objective English 5 th edition.

II Year – I Semester	Audit Course	L	T	P	C
1000202120	Life Skills	2	0	0	0

COURSE OBJECTIVE:

The students will be able to build self-confidence, encourage critical thinking, foster independence and help people to communicate more effectively.

COURSE OUTCOMES:

CO's	At the end of the course, the student will have the ability to:	POs Mapped	Strength of mapping
CO1	Build Self Confidence and Interpersonal and Intrapersonal relationships.	PO12 PO10 PO9	3 3 3
CO2	Practice Emotional Competency while communicating with others	PO12 PO10 PO9	3 3 3
CO3	Gain Intellectual Competency by practicing ethics and morals	PO12 PO10 PO8	3 3 3

UNIT1: LIFE SKILLS: Positive Attitude and Positive Work Ethics, Time Management, Goal Setting: Short term, Long Term. (Activity has to be conducted)

UNIT2: EMOTIONAL INTELLIGENCE: Self Awareness through Johari Window and SWOT analysis (Activity has to be conducted)

UNIT3: PROBLEM SOLVING SKILLS: Critical Thinking and Brain Storming, Creative Thinking, Conflict Management. (Activity has to be conducted)

UNIT4: PUBLIC SPEAKING: Body Language, presentation skills, impromptu presentation, interviewing others. (Activity has to be conducted**)**

UNIT 5: NPTEL Course/ Coursera /Any relevant Certificate Course has to be done

Assessment: In order to clear internal assessment, the student has to submit Project Report and give Presentation on all the activities he/she has done during the course. The student has to do a certificate course also. (Presentation, Project Report and Certificate in total will be the criteria for the assessment)

References:

- Barun K. Mitra; (2011), "Personality Development & Soft Skills", First Edition; Oxford Publishers.
- Kalyana; (2015) "Soft Skill for Managers"; First Edition; Wiley Publishing Ltd.
- Larry James (2016); "The First Book of Life Skills"; First Edition; Embassy Books. Shalini Verma (2014); "Development of Life Skills and Professional Practice"; First Edition; Sultan Chand (G/L) & Company
- John C. Maxwell (2014); "The 5 Levels of Leadership", Centre Street, A division of Hachette Book Group Inc.