CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: B.Tech IV **Branch: Electrical Engineering**
Subject: Electromagnetic Fields **Code: B024411(024)**
Total Theory Periods: 36 **Total Tutorial Periods: 12**
Total Marks in End Semester Exam: 100 **Total Credits: 4**

Course Outcomes: At the end of the course, students will demonstrate the ability to

1. CO1: Compute electric field intensity for various charge distribution.
2. CO2: Compute electric potential, potential difference and energy density in the electrostatic field.
3. CO3: Use the solution of Laplace and Poisson's equations for the calculation of potential and electric field intensity.
4. CO4: Compute magnetic field intensity, magnetic flux density, force and torque for various current carrying elements.
5. CO5: Analyze the time varying electric and magnetic field using Maxwell's equations under time varying conditions.

UNIT I: Basics of Electromagnetic Fields: (6 hours)
Scalars and vectors, vector algebra, Cartesian, Cylindrical and Sphericalcoordinate systems, transformations between coordinate systems, Coulomb's law, Electric field intensity, electricfield due to point charge, line charge, continuous volume charge and surface charge.

UNIT II:Electric Flux and Potential: (6 Hours)
Electric flux and Electric flux density, Gauss's law and its application (symmetricalcharge distribution only),divergence and divergence theorem, Maxwell's first equation, Definition of potentialdifference and potential, potential field of a point charge, potential field between two coaxial cylinders, potentialbetween two conducting spherical shells, conservative property, potential gradient, Energy Density in theElectrostatic field.

UNIT III: Electric current, Poisson& Laplace equations: (6 Hours)
Current and current density, continuity of current, metallicconductors, conductor properties and boundary conditions, the method of images, nature of dielectric materials,boundary conditions for perfect dielectric materials, Poisson and Laplace equation, Uniqueness theorem, examplesof the solution of Laplace equations (one dimension only).

UNIT IV: Magneto staticsand Magnetic Force: (6 Hours)
The steady state magnetic field, BiotSavart Law, Ampere's circuital Law,Curl, Stoke's theorem, Magnetic flux and Magnetic flux density, scalar and vector magnetic potentials, force on amoving charge, force on a differentialcurrent element, force between differential current elements, force and torqueon a closed circuit, magneticmaterials, magnetization andpermeability, Magnetic boundary conditions.

UNIT V: Time Varying Field and Maxwell's Equations:(6 Hours)
Faraday's law of electromagnetic induction, statically anddynamically induced EMFs, displacement current, modification of Maxwell's equations under time varyingconditions (point form and integral form), Poynting Theorem and Poynting vector.

Text Books:

1. William H.Hayt and Jr. John A. Buck , "Engineering Electromagnetics", Tata McGraw-Hill
2. M. N. O. Sadiku, "Elements of Electromagnetics", Oxford University Publication, 2014.
3. A. Pramanik, "Electromagnetism - Theory and applications", PHI Learning Pvt. Ltd, New Delhi, 2009.

Reference Books:

1. A. Pramanik, "Electromagnetism-Problems with solution", Prentice Hall India, 2012.
2. G. W. Carter, "The electromagnetic field in its engineering aspects", Longmans, 1954.
3. W. J. Duffin, "Electricity and Magnetism", McGraw Hill Publication, 1980.
4. W. J. Duffin, "Advanced Electricity and Magnetism", McGraw Hill, 1968.
5. E. G. Cullwick, "The Fundamentals of Electromagnetism", Cambridge University Press,1966.
6. D. Popovic, "Introductory Engineering Electromagnetics", Addison-Wesley Educational publishers, International Edition, 1971.

CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: B.Tech IV **Branch: Electrical Engineering**
Subject: Power Systems – I (Apparatus and Modeling) **Code: B024412(024)**
Total Theory Periods: 36 **Total Tutorial Periods: 12**
Total Marks in End Semester Exam: 100 **Total Credits: 4**

Course Outcomes: Students will be able to:

1. CO1: Describe the concept of national grid and smart grid.
2. CO2: Calculate various line parameters for different configurations of transmission lines.
3. CO3: Perform the analysis of short, medium and long transmission lines.
4. CO4: Solve the problems related to insulation resistance and capacitance calculation in underground cables.
5. CO5: Calculate energy, power, reflection and refraction coefficients for different terminations of transmission lines.

UNIT I: Introduction and modeling (8 hours)
Introduction to Power System: Evolution of power system, Structure of Power System, introduction of bulk Power grid and micro grid, Overview of national grid, Introduction of smart grid
Modeling of Generators and Transformers: Real and reactive capability curve of generators**,** waveform under balanced 3 phase short circuit at the terminals, Steady state, transient and sub transient equivalent circuits, phase shift in star delta transformer, 3 winding transformers, tap changing transformer.

UNIT II: Overhead Line Components and Parameters (10 hours)
Types of conductors i.e., solid, stranded, ACSR and bundled conductors, calculation of inductance and capacitance of single and three phase lines for single and double circuit configuration, concept of GMR and GMD, Effect of earth on line capacitance, skin effect and proximity effect, types of load, voltage and frequency dependence of loads and per unit system.

UNIT III: Transmission Line Performance Analysis (10 hours)
Classification of transmission lines ie short, medium and long lines, nominal T, nominal π, equivalent T and equivalent π circuits, Calculation of ABCD constants for short, medium and long lines, calculation of efficiency and regulation of short, medium and long lines, Ferranti effect, Surge impedance loading.

UNIT IV: Underground Cables (10 hours)
Classification of underground cables, components of underground cables, insulation resistance and capacitance of underground cables and their calculations, capacitance grading and inter sheath grading, capacitance of three core belted cable, dielectric loss in cable and concept of tan δ.

UNIT V: Travelling Waves in Power System (10 hours)
Wave equation for transients in power systems, characteristic impedance, power and energy in travelling waves, calculation of reflection and refraction coefficients of current and voltage for various types of terminations i.e., open circuit, short circuit, inductive and capacitive terminations and their series and parallel combinations, junction of dissimilar lines, repeated reflections and Bewley lattice diagram, introduction of insulation coordination.

Text Books:

1. Nagarath and Kothari, “Power System Engineering”, TMH publisher.
2. B. R. Gupta, “Power System Analysis and Design”, S. Chand Publisher.

Reference Books:

1. Tarun Gonen, “Electric Power Transmission System Engineering and Design”, CRC press, Taylor and Francis series.
2. T. K. Nagaskar and M. S. Sukhija, “Power System Analysis”, Oxford University Press.
3. Jhon J. Grainger and W. D. Stevenson, “Power System Analysis”, Mc Graw Hill Education
4. I. S. Jha, Subir Sen, Rajesh Kumar and D. P. Kothari, “Smart Grid Fundamentals and applications”, New Age International Publication.

CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: B.Tech IV | **Branch: Electrical Engineering**
Subject: Electrical Machines – II | **Code: B024413(024)**
Total Theory Periods: 36 | **Total Tutorial Periods: 0**
Total Marks in End Semester Exam: 100 | **Total Credits: 3**

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

1. CO1: Apply the concepts of AC machine windings.
2. CO2: Analyze the concepts of rotating magnetic fields and operation of three phase Induction Motors.
3. CO3: Understand the working of Single-phase induction motors.
4. CO4: Analyze the performance, and operation of A.C Commutator motor and special motors.
5. CO5: Analyze the performance, characteristics and operation of ac machines.

UNIT I: Fundamentals of AC machine windings (7 hours)
Physical arrangement of windings in stator and cylindrical rotor, slots for windings, single turn coil - active portion and overhang, full-pitch coils, concentrated winding, distributed winding, winding axis, Air-gap MMF distribution with fixed current through winding - concentrated and distributed, Sinusoidally distributed winding, winding distribution factor. Rotating magnetic field.

UNIT II: Three phase Induction Motors (8 hours)
Construction, operation, Types, Torque Slip Characteristics, Starting and Maximum Torque, Equivalent circuit, Phasor Diagram, Losses and Efficiency, Effect of parameter variation on torque speed characteristics (variation of rotor and stator resistances, stator voltage, frequency). Methods of starting, braking and speed control for induction motors.

UNIT III: Single-phase induction motors (6 hours)
Constructional features, Double revolving field theory, Equivalent circuit, Determination of parameters-No load test Blocked rotor test, Cross field theory, starting methods, Characteristics and applications.

UNIT IV: A.C Commutator motor and Special motor (7 hours)
A.C Commutator motor- Construction, principle of operation and application of Single phase series motor, universal motor, Repulsion motor.
Special motor- Construction, principle of operation and application of Variable Reluctance motor, Stepper motor, Linear Induction motor, Permanent Magnet Brushless DC motor, Permanent Magnet Synchronous motor.

UNIT V: Synchronous machines (8 hours)
Synchronous generators- Constructional features, types, Generated EMF, Equivalent circuit, phasor diagram, Operating characteristics, armature reaction, synchronous impedance, voltage regulation (EMF,MMF and zero power factor method), Parallel operation of alternators - synchronization and load division.
Synchronous Motor- Operation, construction**,** analysis of phasor diagram, two reaction theory, V-curves, power angle characteristics.

Text Books:

1. A. E. Fitzgerald and C. Kingsley, "Electric Machinery", McGraw Hill Education, 2013
2. M. G. Say, "Performance and design of AC machines", CBS Publishers, 2002.

Reference Books:

1. P. S. Bimbhra, "Electrical Machinery", Khanna Publishers, 2011.
2. I. J. Nagrath and D. P. Kothari, "Electric Machines", McGraw Hill Education, 2010.
3. A. S. Langsdorf, "Alternating current machines", McGraw Hill Education, 1984.
4. S. Jaganathan, "Special Electrical Machines", Pearson Publication 1st Edition

CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: B.Tech IV | **Branch: Electrical Engineering**
Subject: Signals and Systems | **Code: B024414(024)**
Total Theory Periods: 24 | **Total Tutorial Periods: 12**
Total Marks in End Semester Exam: 100 | **Total Credits: 3**

Course Outcomes:

1. CO1: Understand the concepts of continuous time and discrete time systems.
2. CO2: Analyze the behavior of continuous time and discrete time systems.
3. CO3: Evaluate and analyze the solution of systems using z-Transforms.
4. CO4: Analyze and design systems in complex frequency domain.
5. CO5: Understand sampling theorem and its implications.

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UNIT I: Introduction to Signals and Systems (8 hours)
Introduction, Signal properties, Special signals of importance: the unit step, the unit impulse, the sinusoid, the complex exponential, some special time-limited signals; continuous and discrete time signals, continuous and discrete amplitude signals. Relation between continuous and discrete time systems, System properties: linearity, additivity and homogeneity, shift-invariance, causality, stability.

UNIT II: Behavior of continuous and discrete-time LTI systems (8 hours)
Impulse response and step response, convolution, input-output behavior with aperiodic convergent inputs, cascade interconnections, Characterization of causality and stability of LTI systems, System representation through differential equations, State-space Representation of systems, Periodic inputs to an LTI system, the notion of a frequency response and its relation to the impulse response.

UNIT III: Discrete linear time system analysis with z- Transforms (6 hours)
The z-Transform for discrete time signals and systems, systems described by difference equations, system functions, poles and zeros of systems and sequences, Solution by z-transform , z-domain analysis.

UNIT IV: Fourier analysis (8 hours)
Fourier series representation of periodic signals, Waveform Symmetries, Calculation of Fourier Coefficients, Fourier Transform, convolution/multiplication and their effect in the frequency domain, magnitude and phase response. The Discrete-Time Fourier Transform (DTFT), Parseval's Theorem, Discrete Fourier Transform (DFT), Circular convolution, Linear Filtering Methods Based on the DFT, Overlap-add and save methods.

UNIT V: Sampling and Reconstruction (6 hours)
The Sampling Theorem and its implications, Spectra of sampled signals, Reconstruction: ideal interpolator, zero-order hold, first-order hold, Aliasing and its effects. Introduction to the applications of signal and system theory to communication systems, Sinusoidal Amplitude Modulation and demodulation, Pulse-Amplitude Modulation

Text Books:

1. A. V. Oppenheim, A. S. Willsky and S. H. Nawab, "Signals and systems", Prentice Hall India, 1997
2. J. G. Proakis and D. G. Manolakis, "Digital Signal Processing: Principles, Algorithms, and Applications", Pearson, 2006.

Reference Books:

1. H. P. Hsu, "Signals and systems, Schaums series", McGraw Hill Education, 2010.
2. S. Haykin and B. V. Veen, "Signals and Systems", John Wiley and Sons, 2007.

CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: B.Tech IV | **Branch: Electrical Engineering**
Subject: Analog Electronics | **Code: B024415(024)**
Total Theory Periods: 24 | **Total Tutorial Periods: 12**
Total Marks in End Semester Exam: 100 | **Total Credits: 3**

Course Outcomes: At the end of this course, students will demonstrate the ability to

1. CO1: Design and analyze various rectifier circuits and understand the characteristics of transistors.
2. CO2: Design and analyze amplifier circuits.
3. CO3: Understand the functioning of op-amp.
4. CO4: Analyze the linear applications of op-amp.
5. CO5: Design op-amp based circuits for various operations.

UNIT I: Diode circuits and BJT circuits (8 Hours)
Review of half-wave and full-wave rectifiers; zener diodes; clamping and clipping circuits.
BJT as an amplifier: small-signal model, biasing circuits, current mirror; common-emitter, common-base and common collector amplifiers; Small signal equivalent circuits, high-frequency equivalent circuits

UNIT II: MOSFET circuits (7 Hours)
MOSFET structure and I-V characteristics, MOSFET as a switch. MOSFET as an amplifier: small-signal model and biasing circuits, common-source, common-gate and common-drain amplifiers; small signal equivalent circuits - gain, input and output impedances, transconductance, high frequency equivalent circuit.

UNIT III: Differential, multi-stage and operational amplifiers (8 Hours)
Differential amplifier; power amplifier; direct coupled multi-stage amplifier; internal structure of an operational amplifier, ideal op-amp, non-idealities in an op-amp (Output offset voltage, input bias current, input offset current, slew rate, gain bandwidth product)

UNIT IV: Linear applications of op-amp (7 Hours)
Idealized analysis of op-amp circuits, inverting and non-inverting amplifier, differential amplifier, integrator, active filter, voltage regulator, oscillators (Wein bridge and phase shift).

UNIT V: Nonlinear applications of op-amp (6 Hours):
Voltage comparator, zero crossing detector, Schmitt Trigger, waveform generator (square and triangular), precision half wave and full wave rectifiers, peak detector, level detector.

Text Books:

1. A. S. Sedra and K. C. Smith, "Microelectronic Circuits", New York, Oxford University, Press, 1998
2. Millman and Halkias, "Integrated Electronics", Tata McGraw Hill.
3. J. V. Wait, L. P. Huelsman and G. A. Korn, "Introduction to Operational Amplifier theory and applications", McGraw Hill U. S., 1992.

Reference Books:

1. J. Millman and A. Grabel, "Microelectronics", McGraw Hill Education, 1988
2. P. Horowitz and W. Hill, "The Art of Electronics", Cambridge University Press, 1989.
3. Boylestad and Nashelsky, "Electronic Devices and Circuit Theory", 8th Ed. PHI.
4. P. R. Gray, R. G. Meyer and S. Lewis, "Analysis and Design of Analog Integrated Circuits", John Wiley & Sons, 2001.

CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: B.Tech IV **Branch: Electrical Engineering**
Subject: Power Systems Laboratory - I **Code: B024422(024)**
Total Practical Periods: 24
Total Marks in End Semester Exam: 40 **Total Credits: 1**

Course Outcomes: Students will be able to

1. Demonstrate various types of insulators used in power system.
2. Demonstrate various types of cables used in power system.
3. Measure ABCD constants of short, medium and long lines.
4. Locate fault in a length of cable.
5. Describe the various equipments/components used in transmission Sub Station.

List of experiments: (Minimum 10 experiments are to be performed)

1. To measure ABCD constants of short transmission lines.
2. To measure ABCD constants of medium transmission line.
3. To measure ABCD constants of long transmission lines.
4. To study the types of cables.
5. To locate fault in cable by Murray loop test.
6. To study the types of insulators ie pin insulator and string insulator.
7. To study Ferranti effect.
8. T measure capacitance between conductor-conductor and conductor-earth.
9. Comparison of GMD and GMR for different groups of conductors.
10. To study the Bus Bar arrangement of college power supply Sub Station.
11. To draw the lay out diagram of college power supply system.
12. To draw the lay out diagram of 132/220/400 KV transmission Sub Station.
13. Technical visit of nearby transmission Sub Station.
14. To study Lightning Arrester and Surge Absorbers.

*** All study experiment must involve physical demonstration/simulation.

Requirements: Transmission line trainer, Power system simulation software like MATLAB/Mi Power or equivalent. Pin type insulator, String insulator, Pieces pf various types of cables, Ammeter, Voltmeter, Multimeter and Wattmeter, Resistors, Inductors, Capacitors and Power supplies.

Reference Books:

1. C. L. Wadhwa, “Electrical Power Systems”, New Age International Publishers.
2. Ashfaq Hussain, “Electrical power Systems”, CBS Publishers.
3. J. Arrillaga and N. R. Watson, “Computer Modelling of Electrical Power Systems”, Wiley International Publisher.

CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: B.Tech IV **Branch: Electrical Engineering**
Subject: Electrical Machines Laboratory - II **Code: B024421(024)**
Total Practical Periods: 24
Total Marks in End Semester Exam: 40 **Total Credits: 1**

Course Outcomes: The students will

1. CO1: Get an exposure to common electrical equipment and their ratings.
2. CO2: Perform various tests on three phase induction motor.
3. CO3: Understand the usage of common electrical measuring instruments.
4. CO4: Perform speed control on induction motor.
5. CO5: Determine the voltage regulation of 3 phase alternator by different methods.

List of experiments: (Minimum 10 experiments are to be performed)

1. To determine the equivalent circuit parameters of 3-phase induction motor by No-Load and Block Rotor test.
2. Measurement of Speed of Induction Motor by Measuring Rotor Frequency.
3. To study the speed control of a three phase slip ring I.M by adding external resistance to the rotor circuit.
4. To Study DOL starter and provide connection to 3- phase Induction motor.
5. Speed reversal of 1-phase induction motor.
6. Characteristics of stepper motor.
7. Measurement of circuit Constant of 1-phase induction motor.
8. To study synchronization of two alternators with each other and effect of change in excitation and speed (frequency) on load sharing.
9. To determine the voltage regulation of 3 phase alternator by EMF method.
10. To plot the V and inverted V- curve of synchronous Motor at No Load, and Full Load.
11. Determination of the Xd & Xq of synchronous machine.
12. Determination of zero sequence reactance by synchronous machine.
13. To Study Star-Delta starter and provide connection to 3-phase Induction motor.
14. To study speed control of Induction motor by Cascade connection.
15. To determine the voltage regulation of 3 phase alternator by direct loading.
16. To determine the voltage regulation of 3 phase alternator by ZPF method.

Requirements:

1. 3-Phase Alternator
2. 1-Phase Induction motor,
3. 3-Phase Induction Motor (Slip-ring & cage)
4. DOL starter
5. Single phase variac
6. Three phase variac
7. Stepper Motor
8. Ammeter, Voltmeter, wattmeter
9. Synchronous Motor
10. Rheostats, resistive Load.

Reference Books:

1. Yash Pal, “A Reference Book on Experiments with Basic AC/DC Circuits and Electrical Machines”, Kindle Edition.
2. D. P. Kothari and B. S. Umre, “Laboratory manual for Electrical machines”, J. K. International Publishing House Pvt. Ltd.

CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: B.Tech. IV **Branch: Electrical Engineering**
Subject: Analog Electronics Laboratory **Code: B024423(024)**
Total Practical Periods: 24
Total Marks in End Semester Exam: 40 **Total Credits: 1**

Course Outcomes:

Students will be able to:

1. CO1: Design and test rectifiers, clipping circuits, clamping circuits and voltage regulators.
2. CO2: Design, test and evaluate BJT amplifiers in CE configuration.
3. CO3: Compute the parameters from the characteristics of BJT and MOSFET devices.
4. CO4: Evaluate characteristics of the operational amplifiers.
5. CO5: Design various applications of operational amplifiers.

List of experiments: (Minimum 10 experiments are to be performed)

1. Design half wave and full wave rectifiers and determine ripple factor, rectifier efficiency and regulation
2. Design and set up diode clipping and clamping circuits.
3. Determine Zener diode characteristic and determine line and load regulation characteristics using it as a voltage regulator
4. Design and set up the BJT common emitter amplifier with and without feedback and determine the gain-bandwidth product from its frequency response.
5. Design and measure the frequency response of an RC coupled amplifier using BJT.
6. Design a two stage RC coupled amplifier and determine the effect of cascading on gain and bandwidth
7. Design, setup and plot the frequency response of MOSFET amplifier and obtain the bandwidth.
8. Plot the transfer and drain characteristics of n-channel MOSFET and calculate its parameters - drain resistance, mutual conductance and amplification factor.
9. Evaluate characteristics of the non-ideal operational amplifiers - Output offset voltage, input bias current, input offset current, slew rate, gain bandwidth product.
10. Design and realize inverting and non-inverting amplifier using 741 op-amps and obtain their frequency responses.
11. Design and verify the operation of adder and subtractor circuit using op amp 741.
12. Design and verify the operation of a differentiator and integrator circuits using op amp IC 741 and show that they act as a high pass filter and low pass filter respectively.
13. Design and realize a voltage comparator using op amp 741.
14. Design and realize a wein-bridge oscillator using op amp 741.
15. Design and realize a phase shift oscillator using op amp 741.
16. Design and realize a square wave generator using op amp 741.

Requirements:

Circuit components, Breadboard, Hook-up wire, Power supply, Digital multimeter, CRO, DSO, Function generator.

CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: B.Tech IV **Branch: Electrical Engineering**
Subject: Virtual Laboratory **Code: B025424(024)**
Total Practical Periods: 24
Total Marks in End Semester Exam: 40 **Total Credits: 1**

Course Outcomes: Students will be able to

1. CO1: Develop the simulation models of electrical machines, power system circuits and networks.
2. CO2: Analyze the tests conducted in the electrical machines.
3. CO3: Evaluate the behavior of magnetic field in the machines.
4. CO4: Design the digital circuit using gates.
5. CO5: Justify the theorems by constructing various circuits and models.

List of experiments: (Minimum 10 experiments are to be performed)

Power System lab- link - http://vp-dei.vlabs.ac.in/Dreamweaver/

1. To study the Ferranti Effect of transmission line/cable. (Available- Video/ Simulation)
2. To determine positive sequence, negative sequence and zero sequence reactance of an alternator.(Available- Video/ Simulation)

Electrical machine lab- link - http://em-coep.vlabs.ac.in/

1. Load Test on Separately Excited DC Motor. (Available – Simulator)
2. Speed Control of Separately Excited DC Motor. (Available – Simulator)
3. No Load Test on Three Phase Induction Motor. (Available – Simulator)
4. Blocked Rotor Test on Three Phase Induction Motor. (Available – Simulator)
5. Open Circuit Test on Three Phase Alternator. (Available – Simulator)
6. Short Circuit Test on Three Phase Alternator. (Available – Simulator)
7. Load Test on Three Phase Alternator. (Available – Simulator)
8. V and Inverted V curves of Synchronous Motor. (Available – Simulator)

Electrical Machine lab – link - http://vem-iitg.vlabs.ac.in/

1. To study the generation of magnetic field in a single coil system due to DC and AC current. (Available – Simulator)
2. To study the behaviour of rotating magnetic field in a two coil system due to AC current. (Available – Simulator)
3. To study the behaviour of rotating magnetic field in a three coil system due to AC current. (Available – Simulator)
4. To measure the DC resistance of stator winding of the induction motor. (Available – Simulator)
5. To start the induction motor by connecting external rheostat to the stator winding. (Available – Simulator)
6. To start the induction motor using 3-phase auto-transformer. (Available – Simulator)
7. To start the induction motor using 3-phase auto-transformer. (Available – Simulator)

Digital Electronics and Logic Design – link - http://vlabs.iitb.ac.in/vlabs-dev/labs/dldgates/labs/index.php

1. Design of Multiplexer circuit using gates. (Available – Simulator)
2. Design of Multiplexer circuit using universal logic gates. (Available – Simulator)
3. Design of Demultiplexer circuit using basic logic gates. (Available – Simulator)
4. Design of Demultiplexer circuit using universal logic gates. (Available – Simulator)
5. Application of Multiplexer. (Available – Simulator)

Circuit and Network Laboratory – link - http://ssl-iitg.vlabs.ac.in/

1. Verification of Reciprocity Theorem. (Available – Simulator)

2. Verification of Maximum Power Transfer Theorem. (Available – Simulator)
3. Determination of different parameters of Two-port network and verification of their interrelations. (Available – Simulator)

Note- The experiments are to be involved as the virtual lab while updating of the experiments.

Requirements:

1. Virtual Lab – vlab.co.in
2. Adobe Flash Player

Reference Books:

1. S.G. Tarnekar & P.K. Kharbanda, "Laboratory courses in electrical engineering"
2. Ashfaq Hussain, "Electrical power systems", CBS Publications.
3. P. S. Bimbhra, "Electrical Machinery", Khanna Publishers
4. Morris Mano, "Digital Logic and Concept design", PHI Publications
5. A. K. Sawhney, "A Course In Electrical And Electronics Measurement And Instrumentation", Dhanpat Rai Pbs.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Technology**

Branch: **Common to All Branches** Semester: **IV**

Subject: **Indian Culture and Constitution of India** Code: B000406(046)

Total Theory Periods: **2/Week** Total Tutorial Periods: **NIL**

Assignments: **Two (Minimum)** Total Marks in ESE: **NIL** Marks in TA: **10**

Objective: The Constitution is the supreme law and it helps to maintain **integrity** in the society and to promote unity among the citizens to build a great nation. The main objective of the Indian Constitution is to promote harmony throughout the nation.

Course Objectives

Upon completion of this course, the student shall be able

- To understand Meaning and concepts of Traditional and Modern of Culture
- To understand Sources of the Study of Indian Culture
- To Enable the student to understand the history and importance of constitution
- To understand philosophy of fundamental rights and duties
- To understand the powers and functions of executive, legislature and judiciary
- To understand the powers and functions of state government
- To understand the recent trends in Indian constitutional and election commission of India.

To understand the central and state relation, financial and administrative.

UNIT-I

Meaning and concepts of Culture: Traditional and Modern concepts of Culture-Notions of Culture in textual tradition, anthropological, archaeological and sociological understanding of the term culture. Elements of Culture, concept of Indianness and value system. Relation between culture and civilization. Historiography and approaches to the study of Indian Culture– Stereotypes, Objectivity and Bias, Imperialist, Nationalist, Marxist and Subaltern. Heritage of India and world's debt to Indian Culture.

UNIT–II

Sources of the Study of Indian Culture: Archaeological: cultural remains, Monuments, Numismatics, Epigraphy; Literary sources and Oral traditions; Foreign Accounts; Archival sources.

UNIT–III

History of Indian Constitution Constitutional History, Preamble salient features, citizenship, Method of Amendment and Recent Amendments. **Rights and Duties** Fundamental Rights and Directive Principles of State Policy. Fundamental Duties. Difference between Fundamental Rights and Directive Principles of State Policy

Union Government a) President-powers and functions. Vice president powers and functions, Prime Minister and council of ministers powers and functions. b) Parliament- Loksabha, Rajyasabha- composition powers and functions. c) Judiciary (Supreme Court) composition powers and functions Judicial Activism

UNIT–IV

State Government a) Governor: powers and functions b) Chief minister: powers and functions c) State Legislative Assembly and Legislative Council- composition powers and functions. d) High Court : composition powers and functions

UNIT–V

Recent Trends in Indian Constitutional a) Basic structure of Indian Constitution. b) Electoral Reforms c) Panchayati Raj system in India.

Books of Reference

1. **Dr. P. K. Agrawal** Indian Culture, Art and Heritage,

2. P. Raghunadha Rao Indian Heritage and Culture

3. M.V.Pylee, An Introduction to the Constitution of India,NewDelhi,Vikas,2005.

4. Subhash C.Kashyap, Our Constitution: An Introduction to India's Constitution and constitutional Law, New Delhi, National Book Trust, 2000.

5. Durga Das Basu, Introduction to the Constitution of India ,NewDelhi,Prentice Hall of India,2001.

6. D.C.Gupta, Indian Government and Politics,VIII Edition,New Delhi, Vikas, 1994.

7. V.D.Mahajan, Constitutional Development and National Movement inIndia, New Delhi, S. Chand and Co., latest edition.