VISION OF THE INSTITUTE

Vision:

To empower the students through Academic excellence and Ethics so as to bring about social transformation and prosperity.

MISSION OF THE INSTITUTE

Mission:

- To expand the frontiers of knowledge through quality education.
- To provide value added Research and development.
- To embody a spirit of excellence in Teaching, Creativity, Entrepreneurship and Outreach.
- To provide a platform for synergy of Academy, Industry and Community.
- To inculcate high standards of Ethical and Professional behavior.

VISION OF EEE DEPARTMENT

Vision:

To be recognized as a Centre of Excellence in the field of Education and Research so as to produce competent & Ethical Engineers capable enough to contribute to the society.

MISSION OF EEE DEPARTMENT

Mission:

- To develop innovative, efficient and proficient electrical engineers.
- To keep the curriculum industry friendly, with due regard to the University curriculum.
- To be a place for innovative blended learning and entrepreneurship development in multidisciplinary areas.
- To promote ethical and moral values among the students so as to make them emerge as responsible professionals.

EEE DEPT PROGRAM EDUCATIONAL OBJECTIVES (PEO's)

PEO1: To produce Electrical and Electronics Engineering graduates who have strong foundation in Mathematics, Sciences and Basic Engineering

PEO2: To provide intensive training in problem solving, laboratory skills and design skills to use modern engineering tools through higher education and research.

PEO3: Ability to pursue higher studies and to seek employment in a variety of engineering technology positions and work successfully in their chosen career aspirations and generate entrepreneurs.

PEO4: To inculcate in students professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate engineering issues to broader social context through life-long learning.

PROGRAM OUTCOMES (POs) OF EEE DEPARTMENT

Program Outcomes are the statements that describe what learners will know and be able to do when they graduate from a program.

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10.Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11.Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12.Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES(PSO'S) OF EEE DEPARTMENT

PSO 1: The EEE program must demonstrate knowledge and hands-on competence in the application of electrical and electronics circuits in a rigorous mathematical environment at or above the level of algebra and trigonometry.

PSO 2: The EEE program must demonstrate that graduates can apply interdisciplinary project management techniques to electrical and electronics systems.

PSO 3: The EEE program must demonstrate that graduates can analyze, design and develop hardware and software for control systems, measurements, power electronics and power systems

Year/Semester	II B. Tech/ I Sem	L	T	P	C
Regulation Year	2020-21	3	0	0	3
Subject	Mathematics III (Complex Variables& PDE)				
Branch	EEE				

Course Objectives:

To enable the students to

1. Make use the significance of differentiability and analyticity for complex variable functions and be familiar with the Cauchy-Riemann equations.
2. Find integrals along a path in the complex plane using the Cauchy's theorem and Residue theorem.
3. Solve the singularities of complex variable function by expanding them into Taylor's and Laurent's series and finding residues
4. Make the students learn modeling various physical phenomena as first and higher order PDE and applications

UNIT - I: Functions of Complex Variables

Continuity and differentiability, Analyticity, properties, Cauchy Riemann equations in Cartesian and polar coordinates, harmonic and conjugate harmonic functions, Milne – Thompson method.

Unit -II: Complex Integration

Integration of complex functions – Line Integrals, Cauchy's Integral theorem, Cauchy's Integral Formula - Generalized Cauchy's Integral formula (without proofs)

Unit -III:Complex power series and Residues

Complex power series-Taylor's Series and Laurent's Series, Singularities, Poles and Residues-Cauchy Residues theorem (without proof),evaluation of integrals of type $\int_{-\infty}^{\infty} f(x)dx$ and $\int_0^{2\pi} f(\cos\theta, \sin\theta)d\theta$ using Residue theorem.

Unit-IV: First Order Partial Differential Equations

Formation of Partial differential equations by elimination of arbitrary constants and arbitrary functions– solutions of first order linear (Lagrange) equations and nonlinear equations-standard types

Unit- V: Higher Order Partial Differential Equations and Applications

Solutions of Linear Partial differential equations with constant coefficients. RHS terms of the type $e^{ax + by}$, Sin(ax+by), Cos (ax+by), $x^m y^n$. Classification of second order partial differential equations-parabolic, elliptical and hyperbolic.Method of Separation of Variables, Applications to wave equation, heat conduction equation in one dimensions

Text Books:

1. B. S. Grewal, Higher Engineering Mathematics, 42nd Ed., Khanna Publishers, New Delhi, 2012

2. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Ed., Wiley, 2012.

References:

1. T.K.V.Iyengar, B. Krishna Ghandhi, S. Ranganatham and M.V.S.S.N.Prasad, Engineering Mathematics, Volume-I, 12th Ed., S. Chand Publishers, 2014
2. D. S. Chandrashekharaiah, Engineering Mathematics, Volume 1, Prism Publishers, 2010
3. B. V. Ramana, Engineering Mathematics, 4th Ed., Tata McGraw Hill, New Delhi, 2009
4. S.KaleshaValli, G.VenkataRao and A.V.PapaRao, Engineering Mathematics-I, Cengage Publications, 2018.

Course Outcomes:

After undergoing this course, students will be able to

1. understand the differentiability and analyticity for complex variable functions and learn sufficient conditions for analyticity
2. evaluate the integration of complex valued functions
3. expand the functions in power series, classify the singularities of complex function
4. model first order linear and non-linear partial differential equations and solve analytically
5. model higher order partial differential equations and solve analytically and physical problems of engineering like steady and unsteady heat conduction, vibration of string, etc.,

Year/Semester	II B. Tech/ I Sem	L	T	P	C
Regulation Year	2020-21	3	0	0	3
Subject	ELECTRICAL CIRCUIT ANALYSIS – II				
Branch	EEE				

Course Objectives:

- To study the concepts of balanced and unbalanced three-phase circuits.
- To study the transient behavior of electrical networks with DC 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. .

UNIT-I :

Balanced Three phase circuits

Introduction to three phase circuits, phase sequence, star and delta connection, relation between line and phase voltages and currents, analysis of balanced three phase circuits, measurement of active and reactive power.

UNIT-II :

Unbalanced Three phase circuits

Analysis of three phase unbalanced circuits: Loop method – Star-Delta transformation technique, Two wattmeter methods for measurement of three phase power, Single wattmeter method of measuring reactive power.

UNIT-III :

Transient Analysis

D.C Transient Analysis: Transient Response of R-L, R-C, R-L-C Series Circuits for D.C Excitation using Differential Equation and Laplace Transforms

A.C Transient Analysis: Transient Response of R-L, R-C, R-L-C Series Circuits for Sinusoidal Excitations using Differential Equations and Laplace Transforms.

UNIT-IV :

Two Port Networks

Two port network parameters – Z, Y, ABCD and Hybrid parameters and their relations, Interconnections of two port networks, Poles and zeros of network functions.

UNIT-V :

Network synthesis

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

Course Outcomes:

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

- Solve three phase circuits under balanced and unbalanced conditions.
- Find the transient response of electrical networks for different types of excitations.
- Find various parameters of a two port network.

- Realize electrical equivalent network for a given network transfer function.

Text Books:

1. Engineering Circuit Analysis by William Hayt and Jack E. Kemmerly, Jamie D. Phillips, Steven M. Durbin, McGraw Hill, 9th Edition, 2018.
2. Network analysis by Van Valkenburg Prentice-Hall of India Private Ltd, 3rd edition, 2019.

Reference Books:

1. Circuit Theory Analysis and Synthesis by A.Chakrabarthi, Dhanpat Rai & Co, 7th Revised Edition, 2018.
2. Fundamentals of Electrical Circuits by Charles K.Alexander and Mathew N.O.Sadiku, McGraw Hill, 6th edition, 2019.
3. Introduction to circuit analysis and design by Tildon Glisson. Jr, Springer Netherlands, 1st edition, 2011.

Year/Semester	II B. Tech/ I Sem	L	T	P	C
Regulation Year	2020-21	3	0	0	3
Subject	ELECTROMAGNETIC FIELDS				
Branch	EEE				

Course Objectives:

- To study the three dimensional coordinate system & vector calculus
- To study the production of electric field and potentials due to different configurations of static charges and To study dielectrics, calculate the capacitance
- To study the magnetic fields produced by currents in different configurations, application of ampere's law and the Maxwell's second and third equations.
- To study the magnetic force and torque through Lorentz force equation in magnetic field environment like conductors and other current loops.
- To develop the concept of self and mutual inductances and the energy stored.
- To study time varying and Maxwell's equations in different forms and Maxwell's fourth equation for the induced e.m.f.

UNIT- I :

Three dimensional coordinate system:

Review of vectors-Co-ordinate systems-Cartesian coordinates-Circular cylindrical coordinates-Spherical coordinates & their transformation-Differential length, area and volume in different coordinate systems-Problems.

Electrostatics- I :

Electrostatic Fields – Coulomb's Law – Electric Field Intensity (EFI) – EFI due to a line and a surface charge - problems

UNIT – II :

Electrostatics-II :

Gauss's law – Application of Gauss's Law – Maxwell's first law, div(D)=ρv, Work done in moving a point charge in an electrostatic field–Electric Potential – Potential gradient.

Electric dipole – Dipole moment - Potential and EFI due to an electric dipole, Torque on an Electric dipole in an electric field – Capacitance of parallel plates, spherical dielectrics - Energy stored and energy density in a static electric field.

UNIT – III :

Magneto Statics and Ampere's circuital law:

Biot-Savart's law - Magnetic field intensity (MFI) – MFI due to a straight current carrying filament, circular, square and solenoid current carrying wire – Maxwell's second Equation, div(B)=0.

Ampere's circuital law and its applications viz. MFI due to an infinite sheet, long filament, solenoid current carrying conductor, point form of Ampere's circuital law, Maxwell's third equation (Curl (H)=J).

UNIT – IV :
Force in Magnetic fields :

Magnetic force - Moving charges in a Magnetic field – 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.

UNIT – V :
Inductance:

Self and Mutual inductance – determination of self-inductance of a solenoid and toroid and mutual inductance between a straight long wire and a square loop wire in the same plane – energy stored and density in a magnetic field.

Time Varying Fields:

Faraday's laws of electromagnetic induction –integral and point forms – Statically and dynamically induced EMFs – Modification of Maxwell's equations for time varying fields – Significance of Displacement current- Poynting theorem and Poynting vector.

Course Outcomes:

A student who has met the objective of the course will be able to:

- To determine the location of a point in three dimensional space.
- To determine electric fields and potentials using gauss's law for various electric charge distributions and to Calculate capacitance, energy stored in dielectrics.
- To Calculate the magnetic field intensity due to current, the application of ampere's law and the Maxwell's second and third equations.
- To determine the magnetic forces and torque produced by currents in magnetic field
- To determine self and mutual inductances and the energy stored in the magnetic field.
- To calculate induced e.m.f., understand the concepts of displacement current and time varying fields

Text Books:

1."Engineering Electromagnetics" by William H. Hayt& John. A. Buck Mc. Graw-Hill Companies, 8th Edition, 2014.
2.. "Principles of Electro Magnetics" by Sadiku, Oxford Publications, 6th Edition, 2015.

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. Electromagnetics J. A. Edminister McGraw Hill 3rd Edition, 2010.

Year/Semester	II B. Tech/ I Sem	L	T	P	C
Regulation Year	2020-21	3	0	0	3
Subject	ELECTRONIC DEVICES AND CIRCUITS				
Branch	EEE				

Course objectives:

The objectives of this course is to acquire knowledge on the

i. The basic concepts of semiconductor physics are to be reviewed.

ii. Study the physical phenomena such as conduction, transport mechanism and electrical characteristics of different diodes.

iii. The application of diodes as rectifiers with their operation and characteristics with and without filters are discussed and the principal of working and operation of Bipolar Junction Transistor and Field Effect Transistor and their characteristics are explained.

iv. The need of transistor biasing and its significance is explained. The quiescent point or operating point is explained.

v. Small signal equivalent circuit analysis of BJT and FET transistor amplifiers in different configuration is explained.

UNIT-I:

Semiconductor Physics a: Insulators, Semiconductors, and conductors classification using energy band diagrams, mobility and conductivity, electrons and holes in intrinsic semi conductors and extrinsic semi conductors, drift and diffusion, charge densities in semiconductors, Hall effect, continuity equation, law of junction, Fermi level in intrinsic and extrinsic Semiconductors

Junction Diode Characteristics : Open circuited P-N junction, Biased P-N junction, current components in PN junction Diode, V-I characteristics, Diode resistance, Diode capacitance, energy band diagram of PN junction Diode.

UNIT-II:

Special Semiconductor Diodes: Zener Diode, Breakdown mechanisms, Zener diode applications, LED, Photodiode, Tunnel Diode (Construction, operation and characteristics of all the devices are required to be considered).

Rectifiers and Filters: Need of rectifier, half wave rectifier, full wave rectifiers(Center taped& bridge rectifier) derivations of characteristics of rectifiers, rectifier circuits-operation, input and output waveforms, Filters, Inductor filter, Capacitor filter, comparison of various filter circuits in terms of ripple factors.

UNIT- III:

Transistor Characteristics: BJT: Junction transistor, transistor current components, transistor configurations, , characteristics of transistor in Common Base, Common Emitter and Common Collector configurations, transistor as an amplifier , Photo transistor, typical transistor junction voltage values.

FET: FET types, construction, operation, characteristics, parameters, MOSFET-types, construction, operation, characteristics, comparison between JFET and MOSFET.

UNIT- IV:

Transistor Biasing and Thermal Stabilization : Need for biasing, operating point, load line analysis, BJT biasing- methods, basic stability, Stability factors, (S, S', S''),fixed bias, collector to base bias, self bias, Stabilization against variations in VBE, Ic, and β, Thermal runaway, Thermal stability.FET Biasing- methods and stabilization.

UNIT- V:

Small Signal Low Frequency Transistor Amplifier Models: BJT: Two port network, Transistor hybrid model, determination of h-parameters, conversion of h-parameters, generalized analysis of transistor amplifier model using h-parameters, analysis of CB, CE and CC amplifiers using exact and approximate analysis, comparison of transistor amplifiers. FET: Generalized analysis of small signal model, analysis of CG, CS and CD amplifiers, comparison of FET amplifiers.

Learning Outcomes:

The Student should be able to

i. understand the concepts of Semiconductor Technology.

ii. Learn the construction & operation of electronic devices.

iii. understand the concepts of Transistor and FET

iv.Analysis different biasing circuits.

v. Analysis the amplifier circuits

Text Books:

i.Electronic Devices and Circuits- J. Millman, C. Halkias, Tata Mc-Graw Hill, Second Edition.

ii.Electronics devices & circuit theory- Robert L.Boylestad and Loui Nashelsky, Pearson/Prentice hall, tenth edition

References Books:

i. Electronic Devices and Circuits- Salivahanan, Kumar, Vallavaraj, Tata Mc-Graw Hill, Second Edition..

ii. Electronic Devices and Circuits – David Bell, Oxford

iii. Electronic Devices and Circuits – An Introduction by Allen Mottershead, PHI publications

Year/Semester	II B. Tech/I Sem	L	T	P	C
Regulation Year	2020-21	3	0	0	3
Subject	ELECTRICAL MACHINES– I				
Branch	EEE				

Course Objectives:

- Understand the principles of electromechanical energy conversion and operation of DC generators.
- Learn the operating characteristics and performance of DC motors.
- Understand the testing methods of DC motors and operating principles of single phase transformers
- Understand the performance and methods of testing of single phase transformers
- Analyze the three phase transformers and achieve three phase to two phase conversion

UNIT –I:

Electromechanical Energy Conversion and Introduction to DC Generator:

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

Construction and principle of operation of DC generator – EMF equation– Classification of DC machines based on excitation – Open circuit characteristics of DC shunt generator – Internal and External characteristics of DC shunt generator.

UNIT – II:

DC Motors:

Principle of operation –Types– back EMF and torque equation –characteristics of separately-excited, shunt, series and compound motors – Necessity of starter – Starting by 3 point and 4 point starters – Speed control by armature voltage and field control methods -losses and efficiency – applications of dc motors.

UNIT–III:

Testing of D.C. Machines:

Testing of DC machines - brake test, Swinburne's method –principle of regenerative or Hopkinson's method - separation of losses.

Single Phase Transformers:

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

UNIT – IV:

Testing of Single Phase Transformers:

Open circuit and Short circuit test – Regulation – losses and efficiency , Sumpner's test - separation of losses - Parallel operation – All day efficiency –Auto transformer (Qualitative treatment only).

UNIT – V:

3-Phase Transformers:

Polyphase connections –Y/Y, Y/Δ, Δ/Y, Δ/Δ and open Δ – Third harmonics in phase voltages – three winding transformers: determination of Z_p, Z_s and Z_t – off load and on load tap changers - Scott connection.

Course Outcomes:

After completion of this course the students are

- Able to explain the principles of electromechanical energy conversion and operation of DC generators.
- Able to analyze the operating characteristics and performance of DC motors.
- Able to describe the methods of testing methods of DC motors and principle of transformers.
- Able to analyze the performance and methods of testing of single phase transformers
- Able to understand the three phase transformers and analyze the three phase to two phase conversion.

Text Books:

1. Electric Machines by P.S. Bhimbhra, Khanna Publishers, 2nd Edition, 2017.
2. Electric Machinery by A.E.Fitzgerald, CharlesKingsley, Stephen D.Umans, McGraw Hill Education, 6th Edition, 24th Reprint 2012.
3. The Performance and Design of Alternating Current Machines by M. G. Say, CBS Publishers, 3rd Edition, 2002.

Reference Books:

1. Theory & Performance of Electrical Machines by J.B.Gupta, S.K.Kataria& Sons, Reprint 2013 Edition.
2. Electrical Machines by S.K. Bhattacharya,Mc Graw hill Education,4th Edition 2017
3. Electric Machines by I.J. Nagrath & D.P. Kothari, McGraw Hill Education, 5th Edition 2017.

Year/Semester	II B. Tech/I Sem	L	T	P	C
Regulation Year	2020-21	0	0	3	1.5
Subject	ELECTRICAL MACHINES – I LAB				
Branch	EEE				

Course Objectives:

- To understand the magnetizing characteristics of DC shunt generator
- To learn the speed control methods of DC motors.
- To understandthe performance characteristics of DC machines
- To understand the predetermination of efficiency in DC machines
- To understand the various no load losses in DC machines and transformers
- To predetermine the efficiency and regulation of transformers and assess their performance.

Any 10 of the following experiments are to be conducted

1. Magnetization characteristics of DC shunt generator to determine the critical field resistance and critical speed.
2. Load test on DC shunt generator and determination of its characteristics.
3. Predetermination of efficiency of DC shuntmachines using Hopkinson's test.
4. Predetermination of efficiencyof shunt machine by Swinburne's test
5. Speed control of DC shunt motor by field and armature control.
6. Brake test on DC shunt motor and determination of its performance curves.
7. Separation of losses in DC shunt motor.
8. OC & SC test on single phase transformer.
9. Sumpner's test on single phase transformer.
10. Scott connection of transformers.
11. Parallel operation of single phase transformers.
12. Separation of core losses in single phase transformer.
13. Sumpner's test on three phase transformer.

CourseOutcomes:

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

- Draw the magnetizing characteristics of DC shunt generator
- Control the speed of the DC motors.
- Determine the performance characteristics of DC machines

- Predetermine the efficiency of DC machines
- Separate the no load losses in DC machines and transformers
- To predetermine the efficiency and regulation of transformers

Year/Semester	II B. Tech/I Sem	L	T	P	C
Regulation Year	2020-21	0	0	3	1.5
Subject	ELECTRONIC DEVICES AND CIRCUITS LAB				
Branch	EEE				

Electronic Workshop Practice:

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Bread Boards.
2. Identification, Specifications and Testing of active devices, Diodes, BJTs, JFETs, LEDs,UJT.
3. Study and operation of Ammeters, Voltmeters, Transformers, Analog and Digital Multimeter, Function Generator, Regulated Power Supply and CRO.

List of Experiments: (Minimum of Ten Experiments has to be performed)

1. P-N Junction Diode Characteristics Part A: Germanium Diode (Forward bias& Reversebias) Part B: Silicon Diode (Forward Bias only)
2. Zener Diode V-I Characteristics
3. Zener Diode as Voltage Regulator
4. Half-wave Rectifier(without and with c-filter)
5. Full-wave Rectifier(without and with c-filter)
6. BJT Characteristics(CB Configuration) Part A: Input Characteristics Part B: OutputCharacteristics
7. BJT Characteristics(CE Configuration) Part A: Input Characteristics Part B: OutputCharacteristics
8. FET Characteristics(CS Configuration) Part A: Drain Characteristics Part B: TransferCharacteristics
9. UJT Characteristics
10. Transistor Biasing
11. BJT-CE Amplifier
12. Emitter Follower-CC Amplifier
13. FET-CS Amplifier

Equipment Required:

1. Regulated Power supplies
2. Analog/Digital Storage Oscilloscopes
3. Analog/Digital Function Generators
4. Digital Multimeters
5. Decade Résistance Boxes/Rheostats Decade Capacitance Boxes
6. Ammeters (Analog or Digital)
7. Voltmeters (Analog or Digital)
8. Active & Passive Electronic Components

Year/Semester	II B. Tech/ I Sem	L	T	P	C
Regulation Year	2020-21	0	0	4	2
Subject	SKILL ORIENTED COURSE: DESIGN OF ELECTRICAL CIRCUITS USING ENGINEERING SOFTWARE TOOLS				
Branch	EEE				

Preamble:
The aim of the course is to simulate various theorems and resonance. Also to determine self and mutual inductance of a magnetic circuit, parameters of a given coil through simulation.

Course Objectives:

- To Learn the fundamentals of MATLAB Tools
- To generate various waveform signals and sequences
- To verify and simulate various electrical circuits using Mesh and Nodal
- Analysis
- To verify and simulate various theorems
- To verify and simulate RLC series and parallel resonance.
- To determine self and mutual inductance of a magnetic circuit, parameters of a given coil.

List of Experiments: (Any 10 of the following experiments are to be conducted)
Note: MATLAB/SMULINK fundamentals shall be explained during the first week before starting of the Lab course.

1. Generation of various signals, such as unit Impulse, Step, Square, Sinusoidal, Ramp.
2. Operations on signals such as Addition, Multiplication, Scaling, Shifting, Computation of Energy, and Average Power
3. Verification of Kirchhoff's current law and voltage law using simulation tools.
4. Verification of mesh analysis using simulation tools.
5. Verification of nodal analysis using simulation tools.
6. Determination of average value, rms value, form factor, peak factor of sinusoidal wave, square wave using simulation tools.
7. Verification of super position theorem using simulation tools.
8. Verification of reciprocity theorem using simulation tools.
9. Verification of maximum power transfer theorem using simulation tools.
10. Verification of Thevenin's theorem using simulation tools.
11. Verification of Norton's theorem using simulation tools.
12. Verification of compensation theorem using simulation tools.
13. Verification of Milliman's theorem using simulation tools.
14. Verification of series resonance using simulation tools.
15. Verification of parallel resonance using simulation tools.
16. Verification of self inductance and mutual inductance by using simulation tools.

Course Outcomes:

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

- write the MATLAB programs to simulate the electrical circuit problems
- simulate various circuits for electrical parameters

- simulate various wave form for determination of wave form parameters
- simulate RLC series and parallel resonance circuits for resonant parameters
- simulate magnetic circuits for determination of self and mutual inductances

Year/Semester	II B. Tech/I Sem	L	T	P	C
Regulation Year	2020-21	2	0	0	0
Subject	ENVIRONMENTAL SCIENCE				
Branch	EEE				

Objectives:

To make the student to get awareness on environment, to understand the important of protecting natural recourses, ecosystems for futures generations and pollution causes due to the day to day activates of human life to save Earth from the inventions by the engineers.

UNIT – I: Multidisciplinary nature of Environmental Science and Ecosystems

Definition, Scope and Importance – Sustainability: Need for public awareness-Human population and Environment. Ecosystems: Concept of an ecosystem. - Structure and function of an Ecosystem -Types of Ecosystem-Forest, Grassland, Desert and Aquatic Ecosystems– Food chains, food webs and ecological pyramids.

UNIT – II: Natural Resources

Forest resources: Use and over – exploitation, deforestation – Timber extraction – Mining, dams and other effects on forest and tribal people. Water resources: Conflicts over water, Dams – benefits and problems.

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

Energy resources: Growing energy needs, renewable and non-renewable energy sources. Food resources: World food problems. Land resources: Wasteland reclamation. Role of an individual in conservation of natural resources.

UNIT – III: Biodiversity and its Conservation

Definition, Genetic, species and ecosystem diversity- classification - Value of biodiversity: Consumptive use, Productive use, Social use. Biodiversity at national and local levels. Hot-spots of biodiversity - Threats to biodiversity - Endangered and endemic species of India – Conservation of biodiversity

UNIT – IV: Environmental Pollution \

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

Solid Waste Management: Sources, effects and control measures of urban and industrial solid wastes. Bio medical and e-waste management.

Global Environmental Challenges: Global warming and climate change-Acid rains, Ozone layer depletion.

UNIT – V: Social Issues and Environmental Management

Urban problems related to energy -Water conservation, Rain water harvesting-Resettlement and rehabilitation of people. Environmental Protection Act –Air Act –Water Act - Wildlife Protection Act -Forest Conservation Act-Public awareness.

International protocols: Stockholm and Rio Summit, Kyoto protocol and Montreal Protocol. Impact Assessment and its significance various stages of EIA, Environmental audit, Ecotourism. The student should Visit an Industry / Ecosystem.

Text Books

1. A Textbook of Environmental Studies, Shashi Chawla, TMH, NewDelhi.
2. Textbook of Environmental Studies for Undergraduate Courses by ErachBharucha for University Grants Commission.
3. Environmental Studies, R. Rajagopalan, 2nd Edition, 2011, Oxford UniversityPress.

References

1. Environmental Studies, K. V. S. G. Murali Krishna, VGS Publishers,Vijayawada.
2. Text Book of Environmental Studies, Deekshita Dave & P. Udaya Bhaskar, CengageLearning.
3. Textbook of Environmental Science and Technology – Dr. Anji Reddy, BS Publications.
4. Environment Studies, Anubha Kaushik, C P Kaushik, New Age International Publishers,2014.
5. Environmental Studies, P. N. Palanisamy, P. Manikandan, A. Geetha, and K. Manjula Rani; Pearson Education,Chennai.
6. Environmental Studies, Benny Joseph, Tata McGraw Hill Co, NewDelhi.

Course Outcomes: Students will be able to

1. Articulate the basic structure, functions, and processes of key social systems affecting the Environment.

2. Explain how Natural Recourses should be used.
3. Identify the threats to biodiversity.
4. Understand causes, effects and control measures of Environmental pollution.
5. Gain knowledge about Watershed management and Environmental ethics. Gain a rigorous foundation in various scientific disciplines as they apply to environmental science, such as ecology, evolutionary biology, hydrology, and human behavior.