ACE
ENGINEERING COLLEGE
Ankushapur, Ghatkesar–501301

B.Tech. in ELECTRICAL AND ELECTRONICS ENGINEERING
COURSE STRUCTURE & SYLLABUS (ACER22 Regulations)

II YEAR I SEMESTER

S. No.	Course Code	Course Title	L	T	P	Credits
1	MA301BS	Numerical Methods and Complex variables	3	1	0	4
2	ME302ES	Solid Mechanics & Hydraulic Machines	3	0	0	3
3	EC303ES	Analog Electronics	3	0	0	3
4	EE304PC	Electrical Machines-I	3	1	0	4
5	EE305PC	Electromagnetic Fields	3	0	0	3
6	EE306PC	Electrical Machines Laboratory-I	0	0	2	1
7	EC307ES	Analog Electronics Laboratory	0	0	2	1
8	EE308PC	Electrical Simulation Laboratory	0	0	2	1
9	MC310	Gender Sensitization Laboratory	0	0	2	0
		Total Credits	**15**	**2**	**8**	**20**

MA301BS: NUMERICAL METHODS AND COMPLEX VARIABLES
(Offered in II B.Tech I Sem - EEE)

B. Tech. II Year I Sem.	L	T	P	C
	3	1	0	4

Pre-requisites: Mathematics courses of first year of study.

Course Objectives: To learn

1. Expressing periodic function by Fourier series and a non-periodic function by Fourier transforms
2. Various numerical methods to find roots of polynomial and transcendental equations. Concept of finite differences and to estimate the value for the given data using interpolation.
3. Evaluation of integrals using numerical techniques and Solving ordinary differential equations of first order using numerical techniques.
4. Differentiation and integration of complex valued functions.
5. Evaluation of integrals using Cauchy's integral formula and Cauchy's residue theorem.
   And Expansion of complex functions using Taylor's and Laurent's series.

Course outcomes: After learning the contents of this paper the student must be able to

1. Express any periodic function in terms of sine and cosine
2. Find the root of a given polynomial and transcendental equations.
3. Estimate the value for the given data using interpolation and find the numerical solutions for a given first order ODE's
4. Analyze the complex function with reference to their analyticity.
5. Analyze the complex function with reference to their integration using Cauchy's integral and residue theorems. And Taylor's and Laurent's series expansions in complex function

UNIT-I: Fourier Series & Fourier Transforms: 10 L

Fourier series - Dirichlet's Conditions - Half-range Fourier series - Fourier Transforms: Fourier Sine and cosine transforms - Inverse Fourier transforms.

UNIT-II: Numerical Methods-I 10 L

Solution of polynomial and transcendental equations: Bisection method, Iteration Method, Newton- Raphson method and Regula-Falsi method. Jacobi and Gauss-Seidal iteration methods for solving linear systems of equations.

Finite differences: forward differences, backward differences, central differences, symbolic relations and separation of symbols, Interpolation using Newton's forward and backward difference formulae. Central difference interpolation: Gauss's forward and backward formulae, Lagrange's method of interpolation.

UNIT-III: Numerical Methods-II **8 L**

Numerical integration: Trapezoidal rule and Simpson's $1/3^{rd}$ and $3/8^{th}$ rules. Ordinary differential equations: Taylor's series, Picard's method, Euler and modified Euler's methods, Runge-Kutta method of fourth order for first order ODE

UNIT-IV: Complex Differentiation **10 L**

Limit, Continuity and Differentiation of Complex functions. Cauchy-Riemann equations (without proof), Milne- Thomson methods, analytic functions, harmonic functions, finding harmonic conjugate, elementary analytic functions (exponential, trigonometric, logarithm) and their properties. (All theorems without Proofs), Conformal mappings, Mobius transformations.

UNIT-V: Complex Integration: **10 L**

Line integrals, Cauchy's theorem, Cauchy's Integral formula, zeros of analytic functions, singularities, Taylor's series, Laurent's series, Residues, Cauchy Residue theorem. and their properties. (All theorems without Proofs)

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36^{th} Edition, 2010.
2. S.S. Sastry, Introductory methods of numerical analysis, PHI, 4th Edition, 2005.

REFERENCE BOOKS:

1. M. K. Jain, S.R.K. Iyengar, R.K. Jain, Numerical methods for Scientific and EngineeringComputations, New Age International publishers.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 9^{th} Edition, John Wiley & Sons, 2006.

J. W. Brown and R. V. Churchill, Complex Variables and Applications, 7^{th} Edition, Mc-GrawHill, 2004

ME302ES: SOLID MECHANICS AND HYDRAULIC MACHINES

B.Tech. II Year I Sem **L T P C**

3 0 0 3

Course Objectives:

- To identify an appropriate structural system and work comfortably with basic engineering mechanics and types of loading & support conditions that act on structural systems.
- To Understand the meaning of centers of gravity, centroids, moments of Inertia and rigidbody dynamics.
- To Study the characteristics of hydroelectric power plant and Design of hydraulic machinery.

Course Outcomes: After learning the contents of this paper the student must be able to

- Solve problems dealing with forces, beam and cable problems and understand distributedforce systems.
- Solve friction problems and determine moments of Inertia and centroid of practical shapes.
- Apply knowledge of mechanics in addressing problems in hydraulic machinery and its principlesthat will be utilized in Hydropower development and for other practical usages.

Course Objectives	**Program Outcomes**											
	PO1	**PO 2**	**PO 3**	**PO 4**	**PO5**	**PO6**	**PO 7**	**PO 8**	**PO 9**	**PO1 0**	**PO1 1**	**PO1 2**
To identify an appropriate structural system and work comfortably with basic engineering mechanics and types of loading & support conditions that act on structural systems.	3	3	3	3	3	3	1	1	2	2	1	3
To Understand the meaning of centers of gravity, centroids, moments of	3	2	3	2	3	3	2	2	2	3	2	3

Inertiaand rigid body dynamics.												
To Study the characteristics of hydroelectric power plant and Design of hydraulic machinery.	3	2	3	1	3	3	1	1	2	2	2	3

Course Outcomes	**Program Outcomes**											
	PO1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO6**	**PO 7**	**PO 8**	**PO9**	**PO1 0**	**PO1 1**	**PO12**
Solve problems dealing with forces, beam and cable problems And understand distributed force systems.	3	3	3	3	3	3	3	1	2	1	1	2
Solve friction problems and determine momentsof Inertia and centroid of practical shapes.	3	3	3	3	3	3	3	3	3	3	2	3
Apply knowledge of mechanics in addressing problemsin hydraulic machinery and itsprinciples that will be utilized in Hydropower development and forother practical usages.	3	2	2	2	3	3	3	2	1	3	3	2

UNIT–I:

INTRODUCTION OF ENGINEERING MECHANICS: Basic concepts of System of Forces-Coplanar Forces–Components in Space–Resultant- Moment of Forces andits Application – Couples and Resultant of Force System-Equilibrium of System of Forces-Free body diagrams-Direction of Force Equations of Equilibrium of Coplanar Systems and Spatial Systems – Vector cross product- Support reactions different beams for different types of loading – concentrated, uniformly distributed and uniformly varying loading. Types of friction – Limiting friction – Laws of Friction – static and Dynamic Frictions – Angle of Friction –Cone of limiting friction

UNIT–II:

CENTROID AND CENTER OF GRAVITY: Centroids – Theorem of Pappus-Centroids of Composite figures – Centre of Gravity of Bodies – Area momentof Inertia:– polar Moment of Inertia–Transfer– Theorems - Moments of Inertia of Composite Figures.

SIMPLE STRESSES AND STRAINS ANALYSIS: Concept of stress and strain- St. Venant's Principle- Stress and Strain Diagram - Elasticity and plasticity – Types of stresses and strains- Hooke's law – stress – strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio and volumetric strain – Pure shear and Complementary shear - Elastic modulii, Elasticconstants and the relationship between them

UNIT–III:

KINEMATICS & KINETICS: Introduction – Rectilinear motion – Motion with uniform and variable acceleration–Curvilinear motion– Components of motion– Circular motion Kinetics of a particle – D'Alembert's principle – Motion in a curved path – work, energy and power. Principleof conservationof energy – Kinetics of a rigid body in translation, rotation – work done – Principle of work-energy – Impulse-momentum.

UNIT-IV:

BASICS OF HYDRAULIC MACHINERY: Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes, Jet striking centrally and at tip, Velocity triangles at inlet and outlet, expressions for work done and efficiency Elements of a typical Hydropower installation – Heads and efficiencies

UNIT-V:

TURBINES & PUMPS: Classification of turbines – Pelton wheel – Francis turbine – Kaplan turbine – working, working proportions, velocity diagram, work done and efficiency, hydraulic design. Draft tube

– Classification, functions and efficiency. Governing of turbines, Performance of turbines Pump installation details – classification – work done – Manometric head – minimum starting speed – losses and efficiencies – specific speed. Multistage pumps – pumps in parallel

TEXT BOOKS:

1. M.V. Seshagirirao and Durgaih, "Engineering Mechanics",University Press.
2. P.N Modi and Seth, "Fluid Mechanics and Hydraulic Machinery", standard Book House

REFERENCE BOOKS:

1. B. Bhattacharya, "Engineering Mechanics", Oxford University Publications.
2. Hibbler, "Engineering Mechanics (Statics and Dynamics)", Pearson Education.
3. Fedrinand L. Singer, "Engineering Mechanics" Harper Collings Publishers.
4. A.K.Tayal, "Engineering Mechanics" , Umesh Publication.
5. Domkundwar & Domkundwar, "Fluid mechanics & Hydraulic Machines", Dhanpat Rai & C
6. R.C.Hibbeler, "Fluid Mechanics", Pearson India Education Servieces Pvt. Ltd
7. D.S.Kumar, "Fluid Mechanic & Fluid Power Engineering", Kataria & Sons Publications Pvt. Ltd.
8. Banga & Sharma, "Hydraulic Machines" Khanna Publishers.

EC303ES: ANALOG ELECTRONICS

B. Tech. II Year I Sem.

L	T	P	C
3	0	0	3

Course Objectives:

□ To introduce components such as diodes, BJTs and FETs their switching characteristics, applications

□ Learn the concepts of high frequency analysis of transistors.

□ To give understanding of various types of basic and feedback amplifier circuits such as small signal, cascaded,

large signal and tuned amplifiers.

□ To introduce the basic building blocks of linear integrated circuits.

□ To introduce the concepts of waveform generation and introduce some special function ICs.

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

□ Know the characteristics, utilization of various components.

□ Understand the biasing techniques

□ Design and analyze various rectifiers, small signal amplifier circuits.

□ Design sinusoidal and non-sinusoidal oscillators.

□ Designs OP-AMP based circuits with linear integrated circuits.

UNIT-I:

Diode and Bipolar Transistor Circuits: P-N junction diode, I-V characteristics of a diode; review of half-wave and full-wave rectifiers, clamping and clipping circuits. Input output characteristics of BJT in CB, CE, CC configurations, biasing circuits, Load line analysis, common-emitter, common-base and common collector amplifiers; Small signal equivalent circuits,

UNIT-II:

FET Circuits: FET Structure and VI Characteristics, MOSFET structure and I-V characteristics. MOSFET as a switch. small signal equivalent circuits - gain, input and output impedances, small-signal model and common-source, common-gate and common-drain amplifiers, trans conductance, high frequency equivalent circuit.

UNIT-III:

Multi-Stage and Power Amplifiers: Direct coupled and RC Coupled multi-stage amplifiers; Differential

Amplifiers, Power amplifiers - Class A, Class B, Class C

UNIT-IV:

Feedback Amplifiers: Concepts of feedback – Classification of feedback amplifiers – General characteristics of Negative feedback amplifiers – Effect of Feedback on Amplifier characteristics –Voltage series, Voltage shunt, Current series and Current shunt Feedback configurations – Simple problems.

Oscillators: Condition for Oscillations, RC type Oscillators-RC phase shift and Wien-bridge Oscillators,

LC type Oscillators –Generalized analysis of LC Oscillators, Hartley and Colpitts Oscillators.

UNIT-V:

Operational Amplifiers: Ideal op-amp, Output offset voltage, input bias current, input offset current,

slew rate, gain bandwidth product, Inverting and non-inverting amplifier, Differentiator, integrator, Square-wave and triangular- wave generators.

TEXT BOOKS:

1. Integrated Electronics, Jacob Millman, Christos C Halkias, McGraw Hill Education, 2nd edition 2010

2. Op-Amps & Linear ICs – Ramakanth A. Gayakwad, PHI, 2003.

REFERENCE BOOKS:

1. Electronic Devices Conventional and current version -Thomas L. Floyd 2015, pearson.

2. J. Millman and A. Grabel, “Microelectronics”, McGraw Hill Education, 1988.

3. P. Horowitz and W. Hill, “The Art of Electronics”, Cambridge University Press, 1989.

4. P. R. Gray, R. G. Meyer and S. Lewis, “Analysis and Design of Analog Integrated Circuits”, John Wiley & Sons, 2001.

EE304PC: ELECTRICAL MACHINES-I

B.TECH. II YEAR I SEMESTER	L	T	P	C
	3	1	0	4

Prerequisite: Electrical Circuit Analysis-I &II

Course Objectives:

1. To study different types of DC machines and their performance
2. To understand the performance evaluation of DC machines through various testing methods.
3. To understand the operation of single and ploy-phase Transformers
4. To analyze the performance of transformers through various testing methods.
5. To Understand different connections of Poly phase transformers.

Course Outcomes: Upon completing this course, the student will be able to

1. Explain the theory and principle of operation of DC generators.
2. Explain the theory and principle of operation of DC Motors.
3. Analyze the performance of DC machines through various testing methods.
4. Understand the operation of single and ploy-phase Transformers
5. Analyze the performance of transformers through various testing methods.

UNIT: I D.C. GENERATORS 10L

Principle of operation – Action of commutator – constructional features – armature windings – lap and wave windings – simplex and multiplex windings – use of laminated armature – E. M.F Equation. Armature reaction – Cross magnetizing and de-magnetizing AT/pole – compensating winding – commutation – reactance voltage – methods of improving commutation. Methods of Excitation – separately excited and self-excited generators – build-up of E.M.F - critical field resistance and critical speed - causes for failure to self-excited and remedial measures. Load characteristics and applications of shunt, series and compound generators.

UNIT: II D.C MOTORS 10L

Principle of operation – Back E.M.F. - Torque equation – characteristics and application of shunt, series and compound motors – Armature reaction and commutation. Speed control of D.C. Motors - Armature voltage and field flux control methods. Motor starters (3- point and 4- point starters) Testing of D.C. machines - Losses – Constant & Variable losses –calculation of efficiency – condition for maximum efficiency.

UNIT: III TESTING OF DC MACHINES 10L

Methods of Testing – direct, indirect, and regenerative testing – Brake test – Swinburne's test – Hopkinson's test –Field's test - separation of stray losses in a D.C. motor test.

UNIT: IV **SINGLE PHASE TRANSFORMERS** **10L**

Types - constructional details-minimization of hysteresis and eddy current losses- EMF equation - operation on no load and on load - phasor diagrams and Applications. Equivalent circuit - losses and efficiency – regulation - All day efficiency - effect of variations of frequency &supply voltage on iron losses.

UNIT: V **TESTING OF TRANSFORMERS AND POLY-PHASE TRANSFORMERS 10L**

Open Circuit and Short Circuit tests - Sumpner's test - predetermination of efficiency and regulation-separation of losses test parallel operation with equal and unequal voltage ratios - auto transformers-equivalent circuit - comparison with two winding transformers. Poly-phase transformers – Poly-phase connections - Y/Y, Y/Δ, Δ/Y, Δ/Δ and open Δ, Scott connection and Applications.

TEXTBOOKS:

1. P. S. Bimbhra, "Electrical Machinery", Khanna Publishers, 2011.
2. I.J. Nagrath and D. P. Kothari, "Electric Machines", McGraw Hill Education,5th Edition, 2017.

REFERENCE BOOKS:

1. Prithwiraj Purkait, Indrayudh Bandyopadhyay, "Electrical Machines", Oxford, 2017.
2. E. Fitzgerald and C. Kingsley, "Electric Machinery", New York, McGraw Hill Education, 2013.
3. E. Clayton and N. N. Hancock, "Performance and design of DC machines", CBS Publishers,2004.
4. M. G. Say, "Performance and design of AC machines", CBS Publishers, 2002

WEB REFERENCES:

1. https://nptel.ac.in/courses/108105155
2. https://nptel.ac.in/courses/108105017

EE305PC: ELECTRO MAGNETIC FIELDS

B.TECH. II YEAR I SEMESTER	L	T	P	C
	3	0	0	3

Prerequisite: Ordinary Differential Equations and Vector Calculus & Applied Physics.

Course Objectives:

1. To introduce the concepts of electric field and magnetic field.
2. To know applications of electric fields in the development of the theory for power transmission lines and electrical machines.
3. To know applications of magnetic fields in the development of the theory for power transmission lines and electrical machines.
4. To study about electromagnetic waves.
5. To learn about poynting Theorem

Course Outcomes: Upon completing this course, the student will be able to

1. Analyze the basic laws of electromagnetism.
2. Obtain the electric and magnetic fields for simple configurations under static conditions.
3. Analyze time varying electric and magnetic fields.
4. Apply Maxwell's equation in different forms and different media.
5. Analyze the propagation of EM waves.

UNIT: I STATIC ELECTRIC FIELD 10L

Review of conversion of a vector from one coordinate system to another coordinate system, Coulomb's law, Electric field intensity, Electrical field due to point charges. Line, Surface, and Volume charge distributions. Gauss law and its applications. Absolute Electric potential, potential difference, Calculation of potential differences for different configurations. Electric dipole, Electrostatic Energy and Energy density

UNIT: II CONDUCTORS, DIELECTRICS AND CAPACITANCE 10L

Current and current density, Ohms Law in Point form, Continuity equation, Boundary conditions of conductors and dielectric materials. Capacitance, Capacitance of a two-wire line, Poisson's equation, Laplace's equation, Solution of Laplace, and Poisson's equation

UNIT: III STATIC MAGNETIC FIELDS AND MAGNETIC FORCES 10L

Biot-Savart Law, Ampere Law, Magnetic flux and magnetic flux density, Scalar and Vector Magnetic potentials. Steady magnetic fields produced by current carrying conductors. Force on a moving charge, Force on a differential current element, Force between differential current elements, Magnetic boundary conditions, Magnetic circuits, Self-inductances, and mutual inductances.

Unit: IV TIME VARYING FIELDS AND MAXWELL'S EQUATIONS 10L

Faraday's law for Electromagnetic induction, Displacement current, Point form of Maxwell's equation, Integral form of Maxwell's equations, Motional Electromotive forces.

UNIT: V ELECTROMAGNETIC WAVES 10L

Derivation of Wave Equation, Uniform Plane Waves, Maxwell's equation in Phasor form, Wave equation in Phasor form, Plane wave in free space and in a homogenous material. Wave equation for a conducting medium, Plane waves in lossy dielectrics, Propagation in good conductors. Poynting theorem.

TEXTBOOKS:

1. M. N. O. Sadiku, "Elements of Electromagnetics", Oxford University Publication, 2014.
2. W. Hayt, "Engineering Electromagnetics", McGraw Hill Education, 2012.

REFERENCE BOOKS:

1. W. J. Duffin, "Electricity and Magnetism", McGraw Hill Publication, 1980.
2. W. J. Duffin, "Advanced Electricity and Magnetism", McGraw Hill, 1968.
3. E. G. Cullwick, "The Fundamentals of Electromagnetism", Cambridge UniversityPress, 1966.
4. D. Popovic, "Introductory Engineering Electromagnetics", Addison-Wesley Educational Publishers, International Edition, 1971.
5. A. Pramanik, "Electromagnetism - Theory and applications", PHI Learning Pvt. Ltd, New Delhi,2009.

WEB REFERENCES:

1. https://nptel.ac.in/courses/108104087
2. https://archive.nptel.ac.in/courses/108/106/108106073/

EE306PC: ELECTRICAL MACHINES – I LABORATORY

B.TECH. II YEAR I SEMESTER

L	T	P	C
0	0	2	1

Prerequisite: Electrical Machines- I

Course Objectives:

1. To expose the students to the operation of DC Generators.
2. To know the operation of various types of DC Motors.
3. To examine the performance of Single-Phase Transformers.
4. To examine the performance of Three Phase Transformers.
5. To observe the different connections of three phase transformer.

Course Outcomes: Upon completing this course, the student will be able to

1. Start and control the Different DC Machines.
2. Assess the performance of different machines using different testing methods
3. Identify different conditions required to be satisfied for self - excitation of DC Generators.
4. Separate iron losses of DC machines into different components
5. The student able to assess the performance of the transformer.

List of Experiments:

The following experiments are required to be conducted as compulsory

1. Magnetization characteristics of DC shunt generator (Determination of critical field resistance and critical speed)
2. Load test on DC shunt generator (Determination of characteristics)
3. Load test on DC series generator (Determination of characteristics)
4. Predetermination of efficiency of DC shunt motor with suitable test and Speed Control of DC Shunt Motor
5. Brake test on DC compound motor (Determination of performance curves)
6. Hopkinson's test on DC shunt machines (Predetermination of efficiency)
7. Determination of Equivalent Circuit Parameters of a Single-Phase Transformer
8. Three Phase Transformer: Verification of Relationship between Voltages and Currents (Star Delta, Delta-Delta, Delta-star, Star-Star.

In addition to the above experiments, at least any two of the following experiments are required to be conducted from the following list:

. 1. Brake test on DC shunt motor (Determination of performance curves)
2. Load test on DC compound generator (Determination of characteristics.
3. Fields test on DC series machines (Determination of efficiency)
4. Retardation test on DC shunt motor (Determination of losses at rated speed)
5. Separation of losses in DC shunt motor.
6. Measurement of Voltage, Current and Real Power in primary and Secondary Circuits of a Single-Phase Transformer
7. Load Test on Single Phase Transformer (Calculate Efficiency and Regulation)

WEB REFERENCES:

1.https://ems-iitr.vlabs.ac.in/

EC307ES :ANALOG ELECTRONICS LABORATORY

B. Tech. II Year I Sem.

L	T	P	C
0	0	2	1

Prerequisites: Analog Electronic Circuits

Course Objectives:

□ To introduce components such as diodes, BJTs and FETs their switching characteristics, applications

□ Learn the concepts of high frequency analysis of transistors.

□ To give understanding of various types of basic and feedback amplifier circuits such as small signal, cascaded,

large signal and tuned amplifiers.

□ To introduce the basic building blocks of linear integrated circuits.

□ To introduce the concepts of waveform generation and introduce some special function ICs.

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

□ Know the characteristics, utilization of various components.

□ Understand the biasing techniques

□ Design and analyze various rectifiers, small signal amplifier circuits.

□ Design sinusoidal and non-sinusoidal oscillators.

□ Design OP-AMP based circuits with linear integrated circuits.

List of Experiments:

1. Draw the VI Characteristics of given PN Junction diode. Determine the Static and Dynamic resistance of the

Diode.

2. Determine the Ripple factor, %Regulation PIV and TUF of the given Rectifier with & without filter.

3. Obtain the I/O Characteristics of CE configurations of BJT. Calculate h-parameters from the Characteristics.

4. Obtain the I/O Characteristics of CB configurations of BJT. Calculate h-parameters from the Characteristics.

5. Obtain the I/O Characteristics of CC configurations of BJT. Calculate h-parameters from the Characteristics.

6. Obtain the Drain and Transfer characteristics of CD,CS configuration of JFET. Calculate gm, rd from the Characteristics Adder and Subtractor using Op Amp.

7. Inverting and Non-inverting Amplifiers using Op Amps
8. Adder and Subtractor using Op Amp
9. Integrator Circuit using IC 741.
10. Differentiator circuit using Op Amp.
11. Current Shunt Feedback amplifier
12. Design an RC phase shift oscillator circuit and derive the gain condition for oscillations practically for given
    frequency.
13. Design a Colpitts oscillator circuit for the given frequency and draw the output waveform.
14. Design transformer coupled class A power amplifier and draw the input and output waveforms, find its
    efficiency

□ **Experiments related to MOSFET may be included**

EE308PC: ELECTRICAL SIMULATION LABORATORY

B.TECH. II YEAR I SEMESTER	L	T	P	C
	0	0	2	1

Prerequisite: Electrical Circuit Analysis I & II

Course Objectives:

1. To understand basic block sets of different simulation platform used in electrical/electronic circuit design.
2. To realize use and coding in different software tools used in electrical/ electronic circuit design.
3. To know about the simulation of electric machines/circuits for performance analysis.
4. To Model the Voltage Regulator using suitable simulation tool.
5. To comprehend the performance Solar of PV model using suitable simulation tool.

Course Outcomes: Upon completing this course, the student will be able to

1. Develop knowledge of software packages to model and program electrical and electronics systems.
2. Model different electrical and electronic systems and analyze the results.
3. Articulate importance of software packages used for simulation in laboratory experimentation by analyzing the simulation results.
4. Analyze the performance of Solar PV model using suitable simulation tool.
5. Analyze the software tool for any engineering and real time applications.

List of Experiments:

The following experiments need to be performed from various subject domains.

1. Introduction to basic block sets of simulation platforms. Basic matrix operations, Generation of standard test signals
2. Solving the linear and nonlinear differential equations
3. Measurement of Voltage, Current and Power in DC circuits.
4. Verification of different network theorems with dependent and independent sources using suitable simulation tools.
5. Verification of performance characteristics of basic Electronic Devices using suitable simulation tools.
6. Analysis of series and parallel resonance circuits using suitable simulation tools
7. Obtaining the response of electrical network for standard test signals using suitable simulation tools.
8. Modeling and Analysis of Low pass and High pass Filters using suitable simulation tools
9. Performance analysis of DC motor using suitable simulation tools
10. Modeling and analysis of Equivalent circuit of transformer using suitable simulation tools.
11. Analysis of single-phase bridge rectifier with and without filter using suitable Simulation tools.
12. Modeling and Verification of Voltage Regulator using suitable simulation tools.
13. Modeling of transmission line using simulation tools.
14. Performance analysis of Solar PV model using suitable simulation tools

Students should be encouraged to use open-source software's such as SCILAB, ORCAD, LTSPICE, Ngspice, Octave, Solve Elec, Simulide, CircuitLab, QElectroTech, Circuit Sims, DcAcLab, Every Circuit, DoCircuitsetc. for carrying out the lab simulation listed below.
Use of Professional Licensed versions of softwares like MATLAB, LabVIEW, NI Multisim, PSpice, PowerSim, TINA etc. is also allowed.

Use of 'Python' platform for simulating components/ circuit behaviour.

MC310: GENDER SENSITIZATION LABORATORY

B.TECH II YEAR I SEMESTER

L	T	P	C
0	0	2	0

PREREQUISITES: No

COURSE OBJECTIVE:

1. To develop students' sensibility with regard to issues of gender in contemporary India.
2. To provide a critical perspective on the socialization of men and women.
3. To introduce students to information about some key biological aspects of genders.
4. To expose the students to debates on the politics and economics of work.
5. To help students reflect critically on gender violence and to expose students to more egalitarian interactions between men and women

COURSE OUTCOME: Upon completion of the course, students will be able to:

1. Students will have developed a better understanding of important issues related to gender in contemporary India.
2. Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
3. Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
4. Students will acquire insight into the gendered division of labor and its relation to politics and economics.
5. Men and women students and professionals will be better equipped to work and live together as equals. Students will develop a sense of appreciation of women in all walks of life.

Unit-1 Understanding Gender

Introduction: Definition of Gender-Basic Gender Concepts and Terminology-Exploring Attitudes towards Gender-Construction of Gender-Socialization: Making Women, Making Men - Preparing for Womanhood. Growing up Male. First lessons in Caste

Unit-2 Gender Roles And Relations

Two or Many? -Struggles with Discrimination-Gender Roles and Relations-Types of Gender RolesGender Roles and Relationships Matrix-Missing Women-Sex Selection and Its ConsequencesDeclining Sex Ratio. Demographic Consequences-Gender Spectrum: Beyond the Binary

Unit-3 Gender And Labour

Division and Valuation of Labour-Housework: The Invisible Labor- "My Mother doesn't Work." "Share the Load."-Work: Its Politics and Economics -Fact and Fiction. Unrecognized and Unaccounted work. -Gender Development Issues-Gender, Governance and Sustainable Development-Gender and Human Rights-Gender and Mainstreaming.

Unit-4 Gender - Based Violence

The Concept of Violence- Types of Gender-based Violence-Gender-based Violence from a Human Rights Perspective-Sexual Harassment: Say No!-Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: "Chupulu". Domestic Violence: Speaking OutIs Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Thinking about Sexual Violence Blaming the Victim-"I Fought for my Life…."

Unit-5 Gender And Culture

Gender and Film-Gender and Electronic Media-Gender and Advertisement-Gender and Popular Literature- Gender Development Issues-Gender Issues-Gender Sensitive Language-Gender and Popular Literature - Just Relationships: Being Together as Equals Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Rosa ParksThe Brave Heart.

TEXT BOOK:

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

ASSESSMENT AND GRADING:**:**

1. Discussion & Classroom Participation: 20%
2. Project/Assignment: 30%
3. End Term Exam: 50%

Note: Classes will consist of a combination of activities: dialogue-based lectures, discussions, collaborative learning activities, group work and in-class assignments. Apart from the above prescribed book, Teachers can make use of any authentic materials related to the topics given in the syllabus on "Gender"