NALLA MALLA REDDY ENGINEERING COLLEGE
Autonomous Institution
Accredited by **NAAC** with **'A'** Grade, **NBA** Accredited B.Tech Programs
Sponsored by **Nalla Malla Reddy Education Society**
Website: www.nmrec.edu.in

Department of Electrical & Electronics Engineering

Course Structure & Syllabus: **R20** for II Year B. Tech. (EEE)

II YEAR I SEMESTER

Course Code	Course Title	L	T	P	Credits
ME301ES	Engineering Mechanics	3	0	0	3
EE302PC	Electrical Circuit Analysis	3	1	0	4
EE303PC	Analog & Digital Electronics (Modified)	3	0	0	3
EE304PC	Electrical Machines - I	3	1	0	4
EE305PC	Electromagnetic Fields	3	1	0	4
EE306PC	Electrical Machines Lab - I	0	0	3	1.5
EE307PC	Analog & Digital Electronics Lab. (Modified)	0	0	3	1.5
EE308PC	Electrical Circuits Lab	0	0	3	1.5
*MC309HS	Gender Sensitization	0	0	2	0
MC310HS	English for Professional Communication	0	0	2	0
	Total Credits	**15**	**3**	**13**	**22.5**

II YEAR II SEMESTER

Course Code	Course Title	L	T	P	Credits
MA401BS	Laplace Transforms, Numerical Methods & Complex variables	3	1	0	4
EE402PC	Electrical Machines – II	3	1	0	4
EE403PC	Measurements & Instrumentation	3	1	0	4
EE404PC	Control Systems	3	0	0	3
EE405PC	Power Systems - I	3	0	0	3
EE406PC	Measurements & Instrumentation Lab.	0	0	3	1.5
EE407PC	Electrical Machines Lab - II	0	0	3	1.5
EE408PC	Control Systems Lab	0	0	3	1.5
MC410HS	Constitution of India	3	0	0	0
MC411HS	Interpersonal Communication and Soft Skills (Activity Based) (NEW Course)	0	0	2	0
	Total Credits	**18**	**3**	**11**	**22.5**

ME301ES ENGINEERING MECHANICS

B.Tech. II Year I Sem. (R20) **L T P C**
3 0 0 3

Prerequisites: Nil

Course Objectives: The objectives of this course are to

- Explain the resolution of a system of forces, compute their resultant and solve problems using equations of equilibrium
- Perform analysis of bodies lying on rough surfaces.
- Locate the centroid of a body and compute the area moment of inertia and mass moment of inertia of standard and composite sections
- Explain kinetics and kinematics of particles, projectiles, curvilinear motion, centroidal motion and plane motion of rigid bodies.
- Explain the concepts of work-energy method and its applications to translation, rotation and plane motion and the concept of vibrations

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

- Determine resultant of forces acting on a body and analyse equilibrium of a body subjected to a system of forces.
- Solve problem of bodies subjected to friction.
- Find the location of centroid and calculate moment of inertia of a given section.
- Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion.
- Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration.

UNIT – I Introduction to Engineering Mechanics - Force Systems: Basic concepts, Particle equilibrium in 2-D & 3-D; Rigid Body equilibrium; System of Forces, Coplanar Concurrent Forces, Components in Space – Resultant- Moment of Forces and its Application; Couples and Resultant of Force System, Equilibrium of System of Forces, Free body diagrams, Equations of Equilibrium of Coplanar Systems and Spatial Systems; Static Indeterminacy

UNIT – II Friction: Types of friction, Limiting friction, Laws of Friction, Static and Dynamic Friction; Motion of Bodies, wedge friction, screw jack & differential screw jack; Centroid and Centre of Gravity -Centroid of Lines, Areas and Volumes from first principle, centroid of composite sections; Centre of Gravity and its implications. – Theorem of Pappus

UNIT – III Area moment of inertia- Definition, Moment of inertia of plane sections from first principles, Theorems of moment of inertia, Moment of inertia of standard sections and composite sections; Product of Inertia, Parallel Axis Theorem, Perpendicular Axis Theorem Mass Moment of Inertia: Moment of Inertia of Masses - Transfer Formula for Mass Moments of Inertia – Mass moment of inertia of composite bodies.

UNIT – IV Review of particle dynamics- Rectilinear motion; Plane curvilinear motion (rectangular, path, and polar coordinates). 3-D curvilinear motion; Relative and constrained motion; Newton's 2nd law (rectangular, path, and polar coordinates). Work-kinetic energy, power, potential energy. Impulse-momentum (linear, angular); Impact (Direct and oblique).

UNIT – V Kinetics of Rigid Bodies -Basic terms, general principles in dynamics; Types of motion, Instantaneous centre of rotation in plane motion and simple problems; D'Alembert's principle and its applications in plane motion and connected bodies; Work Energy principle and its application in plane motion of connected bodies; Kinetics of rigid body rotation.

TEXT BOOKS:

1. Shames and Rao (2006), Engineering Mechanics, Pearson Education
2. Reddy Vijay Kumar K. and J. Suresh Kumar (2010), Singer's Engineering Mechanics – Statics & Dynamics

REFERENCE BOOKS:

1. Timoshenko S.P and Young D.H., "Engineering Mechanics", McGraw Hill International Edition, 1983.
2. Andrew Pytel, Jaan Kiusalaas, "Engineering Mechanics", Cengage Learning, 2014.
3. Beer F.P & Johnston E.R Jr. Vector, "Mechanics for Engineers", TMH, 2004.
4. Hibbeler R.C & Ashok Gupta, "Engineering Mechanics", Pearson Education, 2010.
5. Tayal A.K., "Engineering Mechanics – Statics & Dynamics", Umesh Publications, 2011.
6. Basudeb Bhattacharyya, "Engineering Mechanics", Oxford University Press, 2008.

7. Meriam. J. L., “Engineering Mechanics”, Volume-II Dynamics, John Wiley & Sons, 2008.

EE302PC ELECTRICAL CIRCUIT ANALYSIS

B.Tech. II Year I Sem. (R20) **L T P C**
3 1 0 4

Prerequisite: Mathematics - II (Ordinary Differential Equations and Multivariable Calculus) & Basic Electrical Engineering

Course Objectives:
- To understand Magnetic Circuits, Network Topology and Three phase circuits.
- To analyze transients in Electrical systems.
- To evaluate Network parameters of given Electrical network
- To design basic filter configurations

Course Outcomes: At the end of this course, students will demonstrate the ability to
- Apply network theorems for the analysis of electrical circuits.
- Obtain the transient and steady-state response of electrical circuits.
- Analyze circuits in the sinusoidal steady-state (single-phase and three-phase).
- Analyze two port circuit behavior.

UNIT – I Network Theorems: Superposition theorem, Thevenin theorem, Norton theorem, Maximum power transfer theorem, Reciprocity theorem, Compensation theorem. Analysis with dependent current and voltage sources. Node and Mesh Analysis. Concept of duality and dual networks, Millman’s Theorem.

UNIT – II Sinusoidal Steady State Analysis: Representation of sine function as rotating phasor, phasor diagrams, impedances and admittances, AC circuit analysis, effective or RMS values, average power and complex power. Three-phase circuits. Mutual coupled circuits, Dot Convention in coupled circuits, Ideal Transformer.

UNIT – III Solution of First and Second order Networks: Solution of first and second order differential equations for Series and parallel R-L, R-C, RL-C circuits, initial and final conditions in network elements, forced and free response, time constants, steady state and transient state response for DC and AC Excitations. Introduction to Locus Diagrams.

UNIT – IV Electrical Circuit Analysis Using Laplace Transforms: Review of Laplace Transform, Analysis of electrical circuits using Laplace Transform for standard inputs, convolution integral, inverse Laplace transform, transformed network with initial conditions. Transfer function representation. Poles and Zeros. Frequency response (magnitude and phase plots), series and parallel resonances

UNIT – V Two Port Network and Network Functions: Two Port Networks, terminal pairs, relationship of two port variables, impedance parameters, admittance parameters, transmission parameters and hybrid parameters, interconnections of two port networks.

TEXT BOOKS:
1. M. E. Van Valkenburg, “Network Analysis”, Prentice Hall, 2006.
2. D. Roy Choudhury, “Networks and Systems”, New Age International Publications, 1998.

REFERENCE BOOKS:
1. W. H. Hayt and J. E. Kemmerly, “Engineering Circuit Analysis”, McGraw Hill Education, 2013.
2. C. K. Alexander and M. N. O. Sadiku, “Electric Circuits”, McGraw Hill Education, 2004.
3. A Chakrabarthi, “Circuit Theory - Analysis and Synthesis” Dhanpath Rai & Co, 2018.

EE303PC ANALOG AND DIGITAL ELECTRONICS

B.TECH II Year I Sem. (R20) **L T P C**
3 0 0 3

Course Objectives:
- To introduce components such as diodes, BJTs and FETs.
- To know the applications of components.
- To give understanding of various types of amplifier circuits
- To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems.
- To understand the concepts of combinational logic circuits and sequential circuits.

Course Outcomes: Upon completion of the Course, the students will be able to:
- Know the characteristics of various components.
- Understand the utilization of components.
- Design and analyze small signal amplifier circuits.
- Learn Postulates of Boolean algebra and to minimize combinational functions
- Design and analyze combinational and sequential circuits
- Know about the logic families and realization of logic gates.

UNIT - I Diodes and Applications: Junction diode characteristics: Open circuited p-n junction, p-n junction as a rectifier, V-I characteristics, effect of temperature, diode resistance, diffusion capacitance, diode switching times, breakdown diodes, Tunnel diodes, photo diode, LED. Clipping circuits, comparators, Half wave rectifier, Full wave rectifier, rectifier with capacitor filter.

UNIT – II BJTs: Transistor characteristics: The junction transistor, transistor as an amplifier, CB, CE, CC configurations, comparison of transistor configurations, the operating point, self-bias or Emitter bias, bias compensation, thermal runaway and stability, transistor at low frequencies, h-parameter model for CB, CE, CC configurations, small signal equivalent circuits, CE amplifier response, gain bandwidth product, Emitter follower, RC coupled amplifier, two cascaded CE and multi stage CE amplifiers.

UNIT – III FETs and Digital Circuits: FETs: JFET, V-I characteristics, MOSFET, low frequency CS and CD amplifiers, CS and CD amplifiers. Digital Circuits: Digital (binary) operations of a system, OR gate, AND gate, NOT, EXCLUSIVE OR gate, De Morgan Laws, NAND and NOR DTL gates, modified DTL gates, HTL and TTL gates, output stages, RTL and DCTL, CMOS, Comparison of logic families.

UNIT – IV Combinational Logic Circuits: Basic Theorems and Properties of Boolean Algebra, Canonical and Standard Forms, Digital Logic Gates, The Map Method, Product-of-Sums Simplification, Don't-Care Conditions, Quine–McCluskey method, NAND and NOR Implementation, Exclusive-OR Function, Binary Adder-Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers.

UNIT – V Sequential Logic Circuits: Sequential Circuits, Storage Elements: Latches and flip flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Shift Registers, Ripple Counters, Synchronous Counters, Random-Access Memory, Read-Only Memory.

TEXTBOOKS:

1. Integrated Electronics: Analog and Digital Circuits and Systems, 2/e, Jacob Millman, Christos Halkias and Chethan D. Parikh, *Tata McGraw-Hill Education*, India, 2010.
2. Digital Design, 5/e, Morris Mano and Michael D. Cilette, *Pearson,* 2011.

REFERENCE BOOKS:

1. Electronic Devices and Circuits, Jimmy J Cathey, *Schaum's outline series*, 1988.
2. Digital Principles, 3/e, Roger L. Tokheim, *Schaum's outline series*, 1994.

EE304PC ELECTRICAL MACHINES - I

B.Tech. II Year I Sem. (R20)

L	T	P	C
3	1	0	4

Prerequisite: Basic Electrical Engineering

Course Objectives:

- To study and understand different types of DC generators, Motors and Transformers, their construction, operation and applications.
- To analyze performance aspects of various testing methods.

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

- Identify different parts of a DC machine & understand its operation
- Carry out different testing methods to predetermine the efficiency of DC machines
- Understand different excitation and starting methods of DC machines
- Control the voltage and speed of a DC machines
- Analyze single phase and three phase transformers circuits.

UNIT – I D.C. Generators: 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-excitation and remedial measures. Load characteristics of shunt, series and compound generators.

UNIT – II D.C Motors: 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. Structure, operation and merits of Brushless DC Motors.

UNIT – III Testing & Applications of DC Machines: Brake test – Swinburne's test – Hopkinson's test – Field's test - Separation of stray losses in a DC motor test.

UNIT – IV Single Phase Transformers: Types - constructional details-minimization of hysteresis and eddy current losses-EMF equation - operation on no load and on load - phasor diagrams, 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: OC and SC 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.

TEXT BOOKS:

1. A. E. Fitzgerald and C. Kingsley, "Electric Machinery", New York, McGraw Hill Education, 2013.
2. A. E. Clayton and N. N. Hancock, "Performance and design of DC machines", CBS Publishers, 2004.

REFERENCE BOOKS:

1. M. G. Say, "Performance and design of AC machines", CBS Publishers, 2002.
2. P. S. Bimbhra, "Electrical Machinery", Khanna Publishers, 2011.
3. I. J. Nagrath and D. P. Kothari, "Electric Machines", McGraw Hill Education, 2010.

EE305PC ELECTROMAGNETIC FIELDS

B.Tech. II Year I Sem. (R20)

L	T	P	C
3	1	0	4

Prerequisite: Mathematics-II (Ordinary Differential Equations and Multivariable Calculus) & Applied Physics

Course Objectives:

- To introduce the concepts of electric field and magnetic field.
- Applications of electric and magnetic fields in the development of the theory for power transmission lines and electrical machines.

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

- To understand the basic laws of electromagnetism.
- To obtain the electric and magnetic fields for simple configurations under static conditions.
- To analyze time varying electric and magnetic fields.
- To understand Maxwell's equation in different forms and different media.
- To understand the propagation of EM waves.

UNIT – I Static Electric Field: 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.

UNIT – II Conductors, Dielectrics and Capacitance: Current and current density, Ohms Law in Point form, Continuity equation, Boundary conditions of conductors and dielectric materials. Poisson's equation, Laplace's equation, Solution of Laplace and Poisson's equation.

UNIT – III Static Magnetic Fields and Magnetic Forces: Biot-Savart Law, Ampere's Circuital Law, Magnetic flux and magnetic flux density, Scalar and Vector Magnetic potentials. Force on a moving charge, Force on a differential current element, Force between differential current elements, Magnetic boundary conditions.

UNIT – IV Time Varying Fields and Maxwell's Equations: 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: 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.

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

REFERENCE BOOKS:

1. K. A. Gangadhar, P. M. Ramanathan, "Electromagnetic Field Theory", Khanna Publishers, 1997.
2. A. Pramanik, "Electromagnetism - Theory and applications", PHI Learning Pvt. Ltd, New Delhi, 2009.
3. John D. Kraus, Keith R. Carver, "Electromagnetics", Mcgraw-Hill, 1991.

EE306PC ELECTRICAL MACHINES LAB – I

B.Tech. II Year I Sem. (R20)

L	T	P	C
0	0	3	1.5

Prerequisite: Electrical Machines-I

Course Objectives:

- To expose the students to the operation of DC Generator
- To expose the students to the operation of DC Motor.
- To examine the self-excitation in DC generators.

Course Outcomes: After completion of this lab the student is able to

- Start and control the Different DC Machines.
- Assess the performance of different machines using different testing methods
- Identify different conditions required to be satisfied for self - excitation of DC Generators.
- Separate iron losses of DC machines into different components

The following experiments are required to be conducted compulsory experiments:

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. Load test on DC compound generator (Determination of characteristics.
5. Hopkinson's test on DC shunt machines (Predetermination of efficiency)
6. Fields test on DC series machines (Determination of efficiency)
7. Swinburne's test and speed control of DC shunt motor (Predetermination of efficiencies)
8. Brake test on DC compound motor (Determination of performance curves)
9. Brake test on DC shunt motor (Determination of performance curves)
10. Separation of losses in DC Shunt motor.

TEXT BOOKS:

1. A. E. Clayton and N. N. Hancock, "Performance and design of DC machines", CBS Publishers, 2004.
2. M. G. Say, "Performance and design of AC machines", CBS Publishers, 2002.

REFERENCE BOOKS:

1. V Karapetoff, "Experimental Electrical Engineering and Manual for Electrical Testing", Vol-I, J. Wiley & Sons,
2. D. P. Kothari, B. S. Umre, "Laboratory Manual for Electrical Machines", I.K. International Pub, 2017

EE307PC ANALOG AND DIGITAL ELECTRONICS LAB

B.TECH II Year I Sem. (R20)

L	T	P	C
0	0	3	1.5

Course Objectives

- To introduce components such as diodes, BJTs and FETs.
- To know the applications of components.
- To give understanding of various types of amplifier circuits
- To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems.
- To understand the concepts of combinational logic circuits and sequential circuits.

Course Outcomes: Upon completion of the Course, the students will be able to:

- Know the characteristics of various components.
- Understand the utilization of components.
- Design and analyze small signal amplifier circuits.
- Postulates of Boolean algebra and to minimize combinational functions
- Design and analyze combinational and sequential circuits
- Known about the logic families and realization of logic gates.

List of Experiments

1. Full Wave Rectifier with & without filters
2. Common Emitter Amplifier Characteristics
3. Common Base Amplifier Characteristics
4. Common Source amplifier Characteristics
5. Measurement of h-parameters of transistor in CB, CE, CC configurations
6. Input and Output characteristics of FET in CS configuration
7. Realization of Boolean Expressions using Gates
8. Design and realization logic gates using universal gates
9. Generation of clock using NAND / NOR gates
10. Design a 4 – bit Adder / Subtractor
11. Design and realization a Synchronous and Asynchronous counter using flip-flops
12. Realization of logic gates using DTL, TTL, ECL, etc.

EE308PC ELECTRICAL CIRCUITS LAB

B.Tech. II Year I Sem. (R20)

L	T	P	C
0	0	3	1.5

Prerequisite: Basic Electrical Engineering, Electrical Circuit Analysis

Course Objectives:

- To design electrical systems
- To analyze a given network by applying various Network Theorems
- To measure three phase Active and Reactive power.
- To understand the locus diagrams

Course Outcomes: After Completion of this lab the student is able to

- Analyze complex DC and AC linear circuits
- Apply concepts of electrical circuits across engineering
- Evaluate response in a given network by using theorems

The following experiments are required to be conducted as compulsory experiments

1. Verification of Thevenin's and Norton's Theorems
2. Verification of Superposition, Reciprocity and Maximum Power Transfer theorems
3. Locus Diagrams of RL and RC Series Circuits
4. Series and Parallel Resonance
5. Time response of first order RC / RL network for periodic non – sinusoidal inputs – Time constant and Steady state error determination.
6. Two port network parameters – Z – Y parameters, Analytical verification.
7. Two port network parameters – A, B, C, D & Hybrid parameters, Analytical verification
8. Separation of Self and Mutual inductance in a Coupled Circuit. Determination of Co-efficient of Coupling.
9. Verification of compensation & Milliman's theorems
10. Determination of form factor for non-sinusoidal waveform

TEXT BOOKS:

1. M. E. Van Valkenburg, "Network Analysis", Prentice Hall, 2006.
2. D. Roy Choudhury, "Networks and Systems", New Age International Publications, 1998.

REFERENCE BOOKS:

1. W. H. Hayt and J. E. Kemmerly, "Engineering Circuit Analysis", McGraw Hill Education, 2013.
2. C. K. Alexander and M. N. O. Sadiku, "Electric Circuits", McGraw Hill Education, 2004.
3. A Chakrabarthi, "Circuit Theory - Analysis and Synthesis" Dhanpath Rai & Co, 2018.

MC309HS GENDER SENSITIZATION LAB

(An Activity-based Course)

B.Tech. II Year I Sem. (R20) **L T P C**

0 0 2 0

COURSE DESCRIPTION

This course offers an introduction to Gender Studies, an interdisciplinary field that asks critical questions about the meanings of sex and gender in society. The primary goal of this course is to familiarize students with key issues, questions and debates in Gender Studies, both historical and contemporary. It draws on multiple disciplines – such as literature, history, economics, psychology, sociology, philosophy, political science, anthropology and media studies – to examine cultural assumptions about sex, gender, and sexuality.

This course integrates analysis of current events through student presentations, aiming to increase awareness of contemporary and historical experiences of women, and of the multiple ways that sex and gender interact with race, class, caste, nationality and other social identities. This course also seeks to build an understanding and initiate and strengthen programmes combating gender- based violence and discrimination. The course also features several exercises and reflective activities designed to examine the concepts of gender, gender-based violence, sexuality, and rights. It will further explore the impact of gender-based violence on education, health and development.

Objectives of the Course:

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

Learning Outcomes:

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- 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.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labour and its relation to politics and economics.
- 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.
- Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

UNIT - I: 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 – II: GENDER ROLES AND RELATIONS Two or Many? -Struggles with Discrimination-Gender Roles and Relations-Types of Gender Roles- Gender Roles and Relationships Matrix-Missing Women-Sex Selection and Its Consequences- Declining Sex Ratio. Demographic Consequences-Gender Spectrum: Beyond the Binary

UNIT – III: 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 – IV: Gender – Contemporary Perspectives

Gender Justice and Human Rights: International Perspectives
Gender: Constitutional and Legal Perspectives
Media and Gender
Gender: Emerging Issues and Challenges

UNIT – V: GENDER AND CULTURE Gender and Film-Gender and Electronic Media-Gender and Advertisement-Gender and Popular Literature- Gender Development 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 Parks- The Brave Heart.

Note: Since it is Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field from engineering departments.

- *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".*

ESSENTIAL READING: The Textbook, "*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:

- Discussion & Classroom Participation: 20%
- Project/Assignment: 30%
- End Term Exam: 50%

MC310HS ENGLISH FOR PROFESSIONAL COMMUNICATION
(ACTIVITY BASED)

B.Tech. II Year I Sem. (R20) **L T P C**
0 0 2 0

Introduction: English for Professional Communication aims at developing the student's abilities in grammar, oral skills, reading, writing and study skills.

Course Objectives:
- To reinforce L, S, R, W skills and the usage of language in informal and formal situations.
- To identify the barriers in effective communication and overcome these obstacles.
- To enable students to communicate their views and ideas quickly, clearly, assertively and persuasively.
- To build up self- confidence and effectively present information in accordance with audience needs.
- To equip students with the vital communication skills to succeed in the highly competitive International arena.

Learning Outcomes: Students shall be able to:
- Understand how professional communication works
- Employ active listening and responding skills.
- Learn about body language and communicative adjustment in the workplace while dealing with difficult situations.
- Frame grammatically correct sentences and speak fluent English across a wide range of situations.
- Develop professional writing skills.
- Learn the fundamentals of verbal corporate communication with special emphasis on making presentations.
- Improve career building skills.

UNIT-I
Fundamentals of Communication: Communication-an overview; Communication network in Organizations; Barriers and Gateways to Communication; Essentials of Non-verbal Communication-Basics of Phonetics.
Essentials of Grammar and Vocabulary: Parts of Speech; Articles; Prepositions; Subject-verb Agreement; Tenses; Punctuation Marks
Introduction to Sentence- Types of Sentences- Declarative, Imperative, Interrogative and Exclamatory Sentences. Common errors; Indianisms.

UNIT-II
Professional Reading and Writing
Reading Skills: understanding short real world notices, messages, factual materials; interpreting visual information, skimming and scanning; inferring meaning; critical reading; reading and information transfer; Developing Grammatical Accuracy through Reading.
Writing Skills: Different types of Professional Correspondence; Giving Information about a Product; Paragraph Writing-Essay Writing; e-mail writing;
Other Professional Writing – Memos, Circulars, Notice, Agenda, Minutes, Advertising.

UNIT- III
Transformation of Sentences: Direct and Indirect Speech- Degrees of Comparison- Active Voice-Passive Voice – Degrees of Comparison; Simple, Compound and Complex Sentences; Correction of Sentences

UNIT-IV
Professional Speaking
Mastering the Art of Conversation: Features of a Good Conversation; Improving Conversation Skills; Telephoning skills; Dialogues and Debates.
Group Discussion Skills: Dynamics of Group Discussion – Intervention, Summarizing, Voice Modulation, Body Language, Relevance, Fluency and Coherence
Practice – Discussing General Topics, General Interaction and Social Language, Sharing Ideas and Perspectives, Giving Information and Expressing Opinions, Sharing Personal Experiences, Agreeing and Disagreeing.

Public Speaking: Pattern, Method, Persuasion; Interesting Speeches, Different Types of Speeches

UNIT-V

Letter and Report Writing: Types of Letter- Formal Letters- Informal Letters; Arranging Appointments, Asking for Permission, Giving Instructions; Apologizing and Offering Compensation, Making Requests, Technical Reports and Proposals

Reference Books:

1. English for Work: Everyday Business English by Ian Badger, Longman.
2. 30 Days To A More Powerful Vocabulary by Funk Wilfred, Simon.
3. Speak Better Write Better English by Norman Lewis, Goyal Publishers.
4. Communication Skills by Sanjay Kumar, Pushp Lata, Oxford University Press, 2013.
5. Business Communication by C.S.G. Krishnamacharyulu and R. Lalitha, Himalaya Publishing House, 2013.
6. Business and Professional Communication: Keys for Workplace Excellence by Kelly M. Quintanilla, Shawn T. Wahl, Sage Publications India, 2011.
7. English Grammar in Use (Self Practice Book) by Raymond Murphy and Surai
8. 'Communication Books 1,2,3 & 4' by Nalla Malla Reddy Publications Pvt.Ltd

MA401BS LAPLACE TRANSFORMS, NUMERICAL METHODS AND COMPLEX VARIABLES

B.Tech. II Year II Sem. (R20)

L	T	P	C
3	1	0	4

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

Course Objectives:

- Concept, properties of Laplace transforms
- Solving ordinary differential equations using Laplace transforms techniques.
- Various methods to the find roots of an equation.
- Concept of finite differences and to estimate the value for the given data using interpolation.
- Evaluation of integrals using numerical techniques
- Solving ordinary differential equations using numerical techniques.
- Differentiation and integration of complex valued functions.
- Evaluation of integrals using Cauchy's integral formula and Cauchy's residue theorem.
- 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

- Use the Laplace transforms techniques for solving ODE's
- Find the root of a given equation.
- Estimate the value for the given data using interpolation
- Find the numerical solutions for a given ODE's
- Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems
- Taylor's and Laurent's series expansions of complex function

UNIT – I Laplace Transforms: Laplace Transforms; Laplace Transform of standard functions; first shifting theorem; Laplace transforms of functions when they are multiplied and divided by 't'. Laplace transforms of derivatives and integrals of function; Evaluation of integrals by Laplace transforms; Laplace transforms of Special functions; Laplace transform of periodic functions. Inverse Laplace transform by different methods, convolution theorem (without Proof), solving ODEs by Laplace Transform method.

UNIT – II Numerical Methods - I: Solution of polynomial and transcendental equations – Bisection method, Iteration Method, Newton-Raphson method and Regula-Falsi method. 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: Numerical integration: Trapezoidal rule and Simpson's 1/3rd and 3/8 rules. Ordinary differential equations: Taylor's series; Picard's method; Euler and modified Euler's methods; Runge-Kutta method of fourth order.

UNIT – IV Complex Variables (Differentiation): 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.

UNIT – V Complex Variables (Integration): Line integrals, Cauchy's theorem, Cauchy's Integral formula, Liouville's theorem, Maximum-Modulus theorem (All theorems without proof); zeros of analytic functions, singularities, Taylor's series, Laurent's series; Residues, Cauchy Residue theorem (without proof).

TEXT BOOKS:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
2. S.S. Sastry, Introductory methods of numerical analysis, PHI, 4th Edition, 2005.
3. J. W. Brown and R. V. Churchill, Complex Variables and Applications, 7th Ed., Mc-Graw Hill, 2004.

REFERENCE BOOKS:

1. M. K. Jain, SRK Iyengar, R.K. Jain, Numerical methods for Scientific and Engineering Computations, New Age International publishers.

2. Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.

EE402PC ELECTRICAL MACHINES – II

B.Tech. II Year II Sem. (R20) **L T P C**
3 1 0 4

Prerequisite: Basic Electrical Engineering**,** Electrical Machines-I

Course Objectives:

- To deal with the detailed analysis of poly-phase induction motors & Alternators
- To understand operation, construction and types of single-phase motors and their applications in house hold appliances and control systems.
- To introduce the concept of parallel operation of alternators
- To introduce the concept of regulation and its calculations.

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

- Understand the concepts of rotating magnetic fields.
- Understand the operation of ac machines.
- Analyze performance characteristics of ac machines.

UNIT – I Poly-Phase Induction Machines: Constructional details of cage and wound rotor machines-production of a rotating magnetic field - principle of operation - rotor EMF and rotor frequency - rotor reactance, rotor current and Power factor at standstill and during operation.

UNIT – II Characteristics of Induction Machines: Rotor power input, rotor copper loss and mechanical power developed and their inter relation-torque equation-deduction from torque equation - expressions for maximum torque and starting torque - torque slip characteristic - equivalent circuit - phasor diagram - crawling and cogging -.No-load Test and Blocked rotor test –Predetermination of performance-Methods of starting and starting current and Torque calculations.

Speed Control Methods: Change of voltage, change of frequency, voltage/frequency, injection of an EMF into rotor circuit (qualitative treatment only)-induction generator-principle of operation.

UNIT – III Synchronous Machines: Constructional Features of round rotor and salient pole machines – Armature windings – Integral slot and fractional slot windings; Distributed and concentrated windings – distribution, pitch and winding factors – E.M.F Equation. Harmonics in generated e.m.f. – suppression of harmonics – armature reaction - leakage reactance – synchronous reactance and impedance – experimental determination - phasor diagram – load characteristics. Regulation by synchronous impedance method, M.M.F. method, Z.P.F. method and A.S.A. methods – salient pole alternators – two reaction analysis – experimental determination of Xd and Xq (Slip test) Phasor diagrams – Regulation of salient pole alternators.

UNIT – IV Parallel Operation of Synchronous Machines: Synchronizing alternators with infinite bus bars – synchronizing power torque – parallel operation and load sharing - Effect of change of excitation and mechanical power input. Analysis of short circuit current wave form – determination of sub-transient, transient and steady state reactance's.

Synchronous Motors: Theory of operation – phasor diagram – Variation of current and power factor with excitation – synchronous condenser – Mathematical analysis for power developed .- hunting and its suppression – Methods of starting – synchronous induction motor.

UNIT – V: Single Phase & Special Machines: Single phase induction motor – Constructional features-Double revolving field theory – split-phase motors – shaded pole motor.

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. P. C. Sen, "Principles of Electric Machines and Power Electronics", John Wiley & Sons, 2007.

EE403PC MEASUREMENTS AND INSTRUMENTATION

B.Tech. II Year II Sem. (R20) **L T P C**

3 1 0 4

Pre-requisite: Basic Electrical Engineering, Analog Electronics, Electrical Circuit Analysis & Electro Magnetic fields.

Course objectives:

- To introduce the basic principles of all measuring instruments
- To deal with the measurement of voltage, current, Power factor, power, energy and magnetic measurements.
- To understand the basic concepts of smart and digital metering.

Course Outcomes: After completion of this course, the student able to

- Understand different types of measuring instruments, their construction, operation and characteristics
- Identify the instruments suitable for typical measurements
- Apply the knowledge about transducers and instrument transformers to use them effectively.
- Apply the knowledge of smart and digital metering for industrial applications

UNIT- I Introduction to Measuring Instruments

Classification – Torques in moving systems – Ammeters and Voltmeters – PMMC, MI type instruments – expression for the deflecting torque and control torque – Errors and compensations, extension of range using shunts and multipliers. Electrostatic Voltmeters- electrometer type and attracted disc type – extension of range of E.S. Voltmeters.

UNIT- II Potentiometers & Instrument Transformers

Principle and operation of D.C. Crompton's potentiometer – standardization – Measurement of unknown resistance, current, voltage. A.C. Potentiometers: polar and coordinate type's standardization – Applications of CT and PT – Ratio and phase angle errors

UNIT- III Measurement of Power & Energy

Single phase dynamometer wattmeter, LPF and UPF, Double element and three element dynamometer wattmeter, expression for deflecting and control torques – Extension of range of wattmeter using instrument transformers – Measurement of active and reactive powers in balanced and unbalanced systems. Single phase induction type energy meter – driving and braking torques – errors and compensations – testing by phantom loading using rotating sub-standard (RSS) meter. Three phase energy meter – maximum demand meters.

UNIT- IV DC & AC Bridges

Method of measuring low, medium and high resistance – Wheat-stone's bridge – Carey Foster's bridge, Kelvin's double bridge for measuring low resistance, measurement of high resistance – loss of charge method. Measurement of inductance - Maxwell's bridge, Hay's bridge, Anderson's bridge - Owen's bridge. Measurement of capacitance and loss angle - De Sauty's Bridge - Wien's bridge – Schering Bridge.

UNIT-V: Transducers Definition, Classification of transducers, Advantages of Electrical transducers, Characteristics and choice of transducers; Principle operation of LVDT and capacitor transducers; LVDT Applications, Strain gauge and its principle of operation, gauge factor, Thermistors, Thermocouples, Piezo electric transducers, photovoltaic, photo conductive cells, and photo diodes.

Introduction to Smart and Digital Metering: Digital Multi-meter, True RMS meters, Clamp-on meters, Digital Storage Oscilloscope

TEXT BOOKS:

1. G. K. Banerjee, "Electrical and Electronic Measurements", PHI Learning Pvt. Ltd., 2nd Edition, 2016
2. S. C. Bhargava, "Electrical Measuring Instruments and Measurements", BS Publications, 2012.

REFERENCES:

1. A. K. Sawhney, "Electrical & Electronic Measurement & Instruments", Dhanpat Rai & Co. Publications, 2005.
2. R. K. Rajput, "Electrical & Electronic Measurement & Instrumentation", S. Chand and Company Ltd., 2007.
3. E.W. Golding and F. C. Widdis, "Electrical Measurements and measuring Instruments", fifth Edition, Wheeler Publishing, 2011.

EE404PC CONTROL SYSTEMS

B.Tech. II Year II Sem. (R20)

L	T	P	C
3	0	0	3

Prerequisite: Linear Algebra and Calculus, Ordinary Differential Equations and Multivariable Calculus Laplace Transforms, Numerical Methods and Complex variables

Course objectives:

- To understand the different ways of system representations such as Transfer function representation and state space representations and to assess the system dynamic response
- To assess the system performance using time domain analysis and methods for improving it
- To assess the system performance using frequency domain analysis and techniques for improving the performance
- To design various controllers and compensators to improve system performance

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

- Understand the modeling of linear-time-invariant systems using transfer function and state- space representations.
- Understand the concept of stability and its assessment for linear-time invariant systems.
- Design simple feedback controllers.

UNIT – I Introduction to Control Problem: Industrial Control examples. Mathematical models of physical systems. Control hardware and their models. Transfer function models of linear time-invariant systems. Feedback Control: Open-Loop and Closed-loop systems. Benefits of feedback. Block diagram algebra.

UNIT – II Time Response Analysis of Standard Test Signals: Time response of first and second order systems for standard test inputs. Application of initial and final value theorem. Design specifications for second- order systems based on the time-response. Concept of Stability. Routh-Hurwitz Criteria. Relative Stability analysis. Root-Locus technique. Construction of Root-loci.

UNIT – III Frequency-Response Analysis: Relationship between time and frequency response, Polar plots, Bode plots. Nyquist Stability Criterion. Relative stability using Nyquist criterion – gain and phase margin. Closed-loop frequency response.

UNIT – IV Introduction to Controller Design: Stability, steady-state accuracy, transient accuracy, disturbance rejection, insensitivity and robustness of control systems. Root-Locus method of feedback controller design. Design specifications in frequency-domain. Frequency-domain methods of design. Design of Proportional, Integral and Derivative Controllers, Lead and Lag compensation in designs.

UNIT – V State Variable Analysis and Concepts of State Variables: State space model. Diagonalization of State Matrix. Solution of state equations. Eigen values and Stability Analysis. Concept of controllability and Observability. Difference Equations. State-space models of linear discrete-time systems. Stability of linear discrete-time systems.

TEXT BOOKS:

1. M. Gopal, “Control Systems: Principles and Design”, McGraw Hill Education, 1997.
2. B. C. Kuo, “Automatic Control System”, Prentice Hall, 1995.

REFERENCE BOOKS:

1. K. Ogata, “Modern Control Engineering”, Prentice Hall, 1991.
2. J. Nagrath and M. Gopal, “Control Systems Engineering”, New Age International, 2009.
3. Nagoor Kani, “Control Systems”, RBA Publications, 3 Edition

EE405PC POWER SYSTEM - I

B.Tech. II Year II Sem. (R20)

L	T	P	C
3	0	0	3

Prerequisite: Basic Electrical Engineering, Electrical Machines-I, Electrical Machines-II

Course Objectives:

- To understand the different types of power generating stations.
- To examine A.C. and D.C. distribution systems.
- To understand and compare overhead line insulators and Insulated cables.
- To illustrate the economic aspects of power generation and tariff methods.
- To evaluate the transmission line parameters calculations
- To understand the concept of corona

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

- Understand the concepts of power systems.
- Understand the operation of conventional generating stations and renewable sources of electrical power.
- Evaluate the power tariff methods.
- Determine the electrical circuit parameters of transmission lines
- Understand the layout of substation and underground cables and corona.

UNIT – I Generation of Electric Power

Conventional Sources (Qualitative): Hydro station, Steam Power Plant, Nuclear Power Plant and Gas Turbine Plant. Non-Conventional Sources (Qualitative): Ocean Energy, Tidal Energy, Wave Energy, wind Energy, Fuel Cells, and Solar Energy, Cogeneration and energy conservation and storage.

UNIT – II Economics of Generation: Introduction, definitions of connected load, maximum demand, demand factor, load factor, diversity factor, Load duration curve, number and size of generator units. Base load and peak load plants. Cost of electrical energy-fixed cost, running cost, Tariff on charge to customer.

UNIT – III Overhead Line Insulators & Insulated Cables: Introduction, types of insulators, Potential distribution over a string of suspension insulators, Methods of equalizing the potential, testing of insulators. Introduction, insulation, insulating materials, Extra high voltage cables, grading of cables, insulation resistance of a cable, Capacitance of a single core and three core cables, Overhead lines versus underground cables, types of cables.

UNIT – IV Inductance & Capacitance Calculations of Transmission Lines: Line conductors, inductance and capacitance of single phase and three phase lines with symmetrical and unsymmetrical spacing, Composite conductors-transposition, bundled conductors, and effect of earth on capacitance. **Corona:** Introduction, disruptive critical voltage, corona loss, Factors affecting corona loss and methods of reducing corona loss, Disadvantages of corona, interference between power and Communication lines.

UNIT-V A.C. Distribution: Introduction, AC distribution, Single phase, 3-phase, 3 phase 4 wire system, bus bar arrangement, Selection of site for substation. Voltage Drop Calculations (Numerical Problems) in A.C. Distributors for the following cases: Power Factors referred to receiving end voltage and with respect to respective load voltages.

DC Distribution: Classification of Distribution Systems.- Comparison of DC vs. AC and Under-Ground vs. Over- Head Distribution Systems.- Requirements and Design features of Distribution Systems.- Voltage Drop Calculations (Numerical Problems) in D.C Distributors for the following cases: Radial D.C Distributor fed one end and at the both the ends (equal/unequal Voltages) and Ring Main Distributor.

TEXT BOOKS:

1. W.D. Stevenson –Elements of Power System Analysis, Fourth Edition, McGraw Hill, 1984.
2. C.L. Wadhwa –Generation, Distribution and Utilization of Electrical Energy, Second Edition, New Age International, 2009.

REFERENCE BOOKS:

1. C.L. Wadhwa –Electrical Power Systems, Fifth Edition, New Age International, 2009
2. M.V. Deshpande –Elements of Electrical Power Station Design, Third Edition, Wheeler Pub. 1998

3. H. Cotton& H. Barber-The Transmission and Distribution of Electrical Energy

EE406PC MEASUREMENTS AND INSTRUMENTATION LAB

B.Tech. II Year II Sem. (R20)

L	T	P	C
0	0	3	1.5

Pre-requisite: Measurements and Instrumentation

Course Objectives:

- To calibrate LPF Watt Meter, energy meter, P. F Meter using electro dynamo meter type instrument as the standard instrument
- To determine unknown inductance, resistance, capacitance by performing experiments on D.C Bridges & A. C Bridges
- To determine three phase active & reactive powers using single wattmeter method practically
- To determine the ratio and phase angle errors of current transformer and potential transformer.

Course Outcomes: After completion of this lab the student is able to

- to choose instruments
- test any instrument
- find the accuracy of any instrument by performing experiment
- calibrate PMMC instrument using D.C potentiometer

The following experiments are required to be conducted as compulsory experiments

1. Calibration and Testing of single-phase energy Meter.
2. Calibration of dynamometer power factor meter.
3. Crompton D.C. Potentiometer – Calibration of PMMC ammeter and PMMC voltmeter.
4. Kelvin's double Bridge – Measurement of resistance – Determination of Tolerance.
5. Dielectric oil testing using H.T. testing Kit.
6. Schering Bridge & Anderson Bridge.
7. Measurement of 3 - Phase reactive power with single-phase wattmeter.
8. Measurement of displacement with the help of LVDT.
9. Measurement of 3-phase power with single watt meter and two CTs.
10. Resistance strain gauge – strain measurements and Calibration.

TEXT BOOKS:

1. "G. K. Banerjee", "Electrical and Electronic Measurements", PHI Learning Pvt. Ltd., 2nd Edition, 2016
2. "S. C. Bhargava", "Electrical Measuring Instruments and Measurements", BS Publications, 2012.

REFERENCE BOOKS:

1. "A. K. Sawhney", "Electrical & Electronic Measurement & Instruments", Dhanpat Rai & Co. Publications, 2005.
2. "R. K. Rajput", "Electrical & Electronic Measurement & Instrumentation", S. Chand and Company Ltd., 2007.
3. "Buckingham and Price", "Electrical Measurements", Prentice – Hall, 1988.
4. "Reissland, M. U", "Electrical Measurements: Fundamentals, Concepts, Applications", New Age International (P) Limited Publishers, 1st Edition 2010.
5. "E.W. Golding and F. C. Widdis", "Electrical Measurements and measuring Instruments", fifth Edition, Wheeler Publishing, 2011.

EE407PC ELECTRICAL MACHINES LAB – II

B.Tech. II Year II Sem. (R20)

L	T	P	C
0	0	3	1.5

Prerequisite: Electrical Machines – I & Electrical Machines – II

Course Objectives:

- To understand the operation of synchronous machines
- To understand the analysis of power angle curve of a synchronous machine
- To understand the equivalent circuit of a single-phase transformer and single-phase induction motor
- To understand the circle diagram of an induction motor by conducting a blocked rotor test.

Course Outcomes: After the completion of this laboratory course, the student will be able

- Assess the performance of different machines using different testing methods
- To convert the Phase from three phase to two phase and vice versa
- Compensate the changes in terminal voltages of synchronous generator after estimating the change by different methods
- Control the active and reactive power flows in synchronous machines
- Start different machines and control the speed and power factor

The following experiments are required to be conducted as compulsory experiments

1. O.C. & S.C. Tests on Single phase Transformer
2. Sumpner's test on a pair of single-phase transformers
3. No-load & Blocked rotor tests on three phase Induction motor
4. Regulation of a three –phase alternator by synchronous impedance & MMF methods
5. V and Inverted V curves of a three—phase synchronous motor.
6. Equivalent Circuit of a single-phase induction motor
7. Determination of Xd and Xq of a salient pole synchronous machine
8. Load test on three phase Induction Motor
9. Efficiency of a three-phase alternator
10. Scott Connection of transformer

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. P. C. Sen, "Principles of Electric Machines and Power Electronics", John Wiley & Sons, 2007.

EE408PC CONTROL SYSTEMS LAB

B.Tech. II Year II Sem. (R20)

L	T	P	C
0	0	3	1.5

Prerequisite: Control Systems

Course Objectives:

- To understand the different ways of system representations such as Transfer function representation and state space representations and to assess the system dynamic response
- To assess the system performance using time domain analysis and methods for improving it
- To assess the system performance using frequency domain analysis and techniques for improving the performance
- To design various controllers and compensators to improve system performance

Course Outcomes: After completion of this lab the student is able to

- How to improve the system performance by selecting a suitable controller and/or a compensator for a specific application
- Apply various time domain and frequency domain techniques to assess the system performance
- Apply various control strategies to different applications (example: Power systems, electrical drives etc)
- Test system controllability and observability using state space representation and applications of state space representation to various systems

The following experiments are required to be conducted compulsory experiments:

1. Time response of Second order system
2. Characteristics of Synchros
3. Programmable logic controller – Study and verification of truth tables of logic gates, simple Boolean expressions, and application of speed control of motor.
4. Effect of feedback on DC servo motor
5. Transfer function of DC motor
6. Transfer function of DC generator
7. Temperature controller using PID
8. Characteristics of AC servo motor
9. Stability analysis (Bode, Root Locus, Nyquist) of Linear Time Invariant system using suitable software
10. State space model for classical transfer function using suitable software -Verification.

TEXT BOOKS:

1. M. Gopal, “Control Systems: Principles and Design”, McGraw Hill Education, 1997.
2. B. C. Kuo, “Automatic Control System”, Prentice Hall, 1995.

REFERENCE BOOKS:

1. K. Ogata, “Modern Control Engineering”, Prentice Hall, 1991.
2. I. J. Nagrath and M. Gopal, “Control Systems Engineering”, New Age International, 2009.

MC410HS CONSTITUTION OF INDIA

B.Tech. II Year II Sem. (R20)

L	T	P	C
3	0	0	0

Course Objectives: This course offers an introduction to Constitution of India and enables students to understand the autonomous nature of constitutional bodies like Supreme Court and high court, controller and auditor general of India and election commission of India

Course Outcomes:

- Understand the emergence and evolution of Indian Constitution.
- Understand the structure and composition of Indian Constitution
- Analyze Panchayathi Raj institutions as a medium of decentralization

Course Level Learning Outcomes: After the completion of this Course, the student would be able to:

- Comprehend the meaning, nature, essentials and objectives of law along with its Multi-faced role;
- Be acquainted with the source of law and understanding the difference between basic legal categories in the countries with different legal cultures;
- Understand the approaches to law and the balance between Law, Rights and Justice;
- Know the different legal concepts, their meaning, nature, kind and classification;

Unit-I Meaning of the constitution law and constitutionalism-Historical perspective of the Constitution of India-Salient features and characteristics of the Constitution of India

Unit-II Scheme of the fundamental rights-The scheme of the Fundamental Duties and its legal status-The Directive Principles of State Policy - Its importance and implementation

Unit-III Federal structure and distribution of legislative and financial powers between the Union and the States-Parliamentary Form of Government in India - The constitution powers and status of the President of India-Amendment of the Constitutional Powers and Procedure

Unit-IV The historical perspectives of the constitutional amendments in India-Emergency Provisions: National Emergency, President Rule, Financial Emergency

Unit-V Local Self Government - Constitutional Scheme in India-Scheme of the Fundamental Right to Equality-Scheme of the Fundamental Right to certain Freedom under Article 19-Scope of the Right to Life and Personal Liberty under Article 21

References:

1. "Introduction to the Constitution of India" by D D Basu
2. "The Constitution of India(Brief)" by Pranay Pillewan
3. "Indian Administration" by Hoshiar Singh
4. "Indian Polity" by M Laxmikanth

Modalities to be adopted to teach the subject

1. Meaning of the constitution law and constitutionalism:
   Mode: The faculty has to read and explain the preamble of the constitution. A recap has to be done in the subsequent class to assess to what extent the student is able to understand the main provisions of constitution. (Only very important clauses like fundamental rights, personal liberties, etc.)
2. Historical perspective of the Constitution of India:
   Mode: Ask the students to write a brief note on the topic as an assignment.
3. Salient features and characteristics of constitution of India:
   Mode: Ask students to answer a Quiz on limited topics to be given in advance.

4. The Scheme of Fundamental Rights.
5. The scheme of fundamental duties:
   Mode 1: Ask each student to tell a fundamental right and the recourse available in case of depriving of such rights in class. Topic is to be informed in advance for his home preparation.
   Mode 2: Case Study: Simple court cases to be discussed in class to explain the consequences.
6. Directive principles of State Policy: Importance and Implementation.
   Mode: Invite a guest especially constitutional lawyer and highlight the contents.
7. Federal structure and distribution of legislative and financial powers between the union and state:
   Mode: Ask the students to draw a diagram on the subjects and explain the drawings.
8. Parliamentary Form of Government in India - The constitution powers and status of the president of India.
   Mode: Invite parliamentarian/constitutional lawyer for a lecture.
9. Amendments of the constitutional powers and procedures.
10. The historical perspectives of the constitutional amendments in India.
    Mode 1: Faculty to discuss only main amendments of our day to day life which affect our basic Rights and Duties.
    Mode 2. A Case study can be taken.
11. Emergency Provisions-National Emergency, President Rule and Financial Emergency
    Mode 1: Faculty has to explain the concepts and also the ill effects of excesses in emergency.
    Mode 2. A Case study can be taken.
12. Local Self Government -Constitutional Scheme in India.
    Mode: Invite an official from GHMC/Municipality of higher rank to explain the concept of local Self-government taking into account the constitutional scheme in India.
13. Scheme of fundamental right to equality
    Mode: Faculty has to explain the concept and the consequences to be faced if not followed.
    Skit: a small skit by the students violating the fundamental right to equality – untouchability and imposing punishment thereof.
14. Scheme of the fundamental rights to certain freedom under article 19.
15. Scope of the right to life and personal liberty under article 21.
    Mode: Invite a lawyer to highlight the article 19 & 21.

MC411HS INTERPERSONAL COMMUNICATION AND SOFT SKILLS
(ACTIVITY- BASED)

B.Tech. II Year II Sem. (R20)

L	T	P	C
0	0	2	0

Introduction: *The Interpersonal Communication and Soft Skills Lab* intends to provide opportunities to learners to practice their communicative skills which in turn make them become proficient users of English. It also helps to enhance the performance of learners at placement interviews and group discussions and other recruitment procedures.

Course Objectives:

- To enable learners to develop their communicative competence.
- To enable learners to fine-tune their linguistic skills (LSRW) with the help of technology to communicate globally.
- To facilitate them to hone their soft skills.
- To equip them with employ-ability skills and to enhance their prospects of placements.
- To enhance their ability to communicate effectively in interviews.
- To strengthen their prospects of success in competitive examinations.

Learning Outcomes: Students will be able to attain

- Better understanding of nuances of English language through audio- visual experience and group activities
- Speakingskillswithclarityandconfidencewhichinturnenhancestheiremployability skills
- Take international examination such as IELTS and TOEFL.
- Make presentations and Participate in Group Discussions.

UNIT-I: Listening and Speaking Skills

Conversational skills (formal and informal) -Listening to Lectures, Discussions, Talk Shows, News Programmes, Dialogues from TV/Radio/Ted Talk/Podcast – Listening and Note-taking – Listening to Telephonic Conversations – Ted talks – Inspiring Speeches – Watching Documentaries on Personalities, Places, Socio-cultural Events. etc., Conversation Practice – Introducing Oneself and Others – Role play – Debate

Why is GD part of selection process? - Structure of GD – Moderator – Strategies in GD – Team work - Body Language - Mock GD -Video samples – Panel Discussion – Elements of Effective Presentation – Structure of Presentation - Presentation Tools – Voice Modulation – Neutral Accent- Audience Analysis - Body language – Video Samples.

UNIT-II: Reading and Writing Skills

Reading strategies like Note-making – Reading Graphs, Charts and Graphic Organizer – Sequencing Sentences – Reading Online Sources like e-books, e-journals and e-newspapers.

Resume Writing: Structure and Presentation, Planning, Defining the Career Objective, Projecting One's Strengths and Skill-sets, Summary, Formats and Styles- Writing Job Applications – Cover letter – emails – Memos – Blogs – Writing for Publication.

UNIT-III: English For National And International Examinations And Placements

International English Language Testing System (IELTS) – Test of English as a Foreign Language (TOEFL) – Graduate Record Examination (GRE) – Civil Service (Language related) – Verbal ability-Preparing for Other Competitive Examinations.

UNIT IV : Soft Skills Motivation – Self-image – Goal Setting – Managing Changes – Time Management – Stress Management & Poise – Leadership Traits – Team Work – Career and Life Planning ; Multiple Intelligences – Emotional Intelligence – Intercultural Communication – Creative and Critical Thinking –Learning Styles and Strategies – Psychometrics – Innovation and Creativity -- Video Samples

UNIT-V: Interview Skills: Interview Skills: Concept and Process, Pre-interview planning, Opening Strategies, Answering Strategies- Kinds of interviews – Required Key Skills – Corporate culture -Different types of Interview Format- Mock Interviews-Body Language (paralinguistic features) - Interview through Tele and Video-conferencing- – Mock interviews-Video Samples-Practice Sessions.

Reference Books:

1. Barker, A. “Improve Your Communication Skills”, New Delhi: Kogan Page India Pvt. Ltd., 2006.
2. Craven, Miles. “Listening Extra – A resource book of multi-level skills activities”, Cambridge University Press, 2004.
3. Gammidge, Mick, “Speaking Extra – A resource book of multi-level skills activities”, Cambridge University Press, 2004.
4. Hartley, Peter. “Group Communication”, London: Routledge, 2004.
5. John Seely, “The Oxford Guide to Writing and Speaking”, New Delhi: Oxford University Press, 2004.
6. Naterop, Jean & Rod Revell, “Telephoning in English”, Cambridge University Press, 1987.
7. Ramesh, Gopalswamy and Mahadevan Ramesh, “The ACE of Soft Skills”. New Delhi: Pearson, 2010.